INTERNATIONAL
Standards Worldwide

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Committee D02 on PETROLEUM PRODUCTS AND LUBRICANTS

January 23, 2006

Reply to:
Donald T. Bartlett
The Lubrizol Corporation
29400 Lakeland Blvd.
Wickliffe, OH 44092
(440) 347-2388
(440) 347-2878 (FAX)

ASTM D02.B0.03 L-37 Surveillance Panel
Members and Guests:

Attached for your review and comment are the unconfirmed minutes of the:

- **December 8th, 2005 L-37 Hardware TF visit to Dana Lugoff SC. facility**.

Please direct any corrections or comments to my attention.

Sincerely,

Donald T. Bartlett

Donald T. Bartlett, Chairman
L-37 Surveillance Panel
Attachments

Report of Dana Facility Visits by
L-37 Hardware Task Force
December 8th, 2005 Lugoff SC Facility Visit

I. Attendees:

Ethyl Corp:	Cory Koglin	Lubrizol Corp:	Don Bartlett
Lubrizol Corp:	Pete Kampe	Lubrizol Corp:	Chris Schenkenberger
PARC:	Dale Smith	ASTM TMC:	Don Lind
Dana Corp:	Craig Jones – Plant manager		
Dana Corp:	Don Kreinbring – Off-Highway Division Engineer & Dana ASTM Rep		
Dana Corp:	Gene Lawrence – Area manager – operations manager for light and heavy axle lines (transferred from Statesville facility)		
Dana Corp:	Derek Ottley – Assembly Process Engineer		
Dana Corp:	Steve Bird – Chief engineer for product engineering and responsible for product support, quality, and field support Chief Engineer		
Dana Corp:	Steve Roller – Resident Axle engineer from Statesville		
Dana Corp:	Sam Geary – Assembly supervisor for light axle area		

II. Agenda:

- Introductions
- Recap of 2005 Industry Order and assembly process requirements
- Review of specific requirements and concerns requested by the L-37 Surveillance Panel

III. Action Items from our meeting:

- Mr. Lawrence – verify the high cost carrier is being used for this build.
- Dana to confirm that all net forged gears were being used in this build, no mixing of the two types.
- Dana to confirm that the carriers being used for this build were the ones machined in the one-step CNC process.
- Mr. Ottley maintains documentation of special requirements for the ASTM axle set. He will update any missing requirements into a new "special" drawing set and make those available to the ASTM committee.
- Mr. Kreinbring – update the ASTM Dana Model 60 drawings with high accuracy carrier part number and sourcing information.
- Mr. Bartlett is to PDF copies of the new pattern Length/Flank contact pattern charts to Mr. Ottley.
- Mr. Kreinbring is to add a note to the assembly drawing to add grease to the pinion bearing sparingly and provide drawing updates to the panel for future reference.
- Dana to document turning torque, backlash, and gear pattern for the entire gear set. Each gear set will also be labeled with this information on the carrier.
- Dana to document rework % record.

IV. Summary Facility Visit and Discussion, Consensus Actions, and Motions:

Mr. Craig Jones welcomed the ASTM Hardware Task Force group and opened with a presentation on the background of the Lugoff facility. They formerly made class 8 chassis for Mack and Western Star. Current products made at this facility include:

- Cement mixer chassis
- Trailer chassis
- Now do suspension
- Heavy axle
- Light axle line which was transferred from Statesville

Manufacturing Volume:

- 60% of what Dana builds at this facility is 1 to 9 pieces
- Big axle order to this facility is 100 plus axles

2005 Non-lubrited hardware P4L792/VL417 discussion:

Chairman Bartlett provided a summary recap of the L-37 Surveillance Panel goals and request of the L-37 Hardware Task Force visit to the Lugoff facility. He stressed the importance of the Three "Cs" that are a concern for our hardware; Consistency, Consistency, and Consistency and the reasoning why the L-37 testing industry places a combined 2-year industry axle order. This represents approximately a 1.2 million dollar order for the four labs to be used to meet testing commitment through 2007. We expressed that the axles serve as a yardstick to measure test lubricants and need to perform at a consistent severity level. Essentially, they are not axles to run on the road, rather, serve as gages to evaluate an oils performance level.

Mr. Kreinbring provided some assembly drawings for the L37 and L44 axles. He agreed to provide PDF file documentation of the drawings that Dana determines that can be released. He mentioned that Dave Shippee has been assigned the Mr. Ramsey's role within Dana. Ken Miller (not present at meeting) is familiar with design, manufacture and failure analysis, contact patterns. Ken conducts training sessions for setting gear patterns and is a key keeper of axle assembly and component knowledge at the plant. He worked closely with Mr. Okamuro for several of the last axle builds. Dana will have Mr. Miller on-hand to determine proper shimming to establish the proper contact pattern when our gears begin assembly. At the beginning of the run, it is important to establish the proper shimming

Mr. Lawrence mentioned that 3 engineers that were part of the last build at Statesville are now employed at Lugoff and involved with this order. There are also 3 operators that have moved from Statesville who were part of the last build order. He also mentioned that Lugoff employees were sent to Statesville for a 6-month training period to understand the light duty axle order.

The Dana Process Sheet which contains special instructions for the ASTM build of the L37 axles was distributed by Mr. Ottley and is included as ***Attachment # 1.*** As previously informed by Mr. Okamuro, this batch of gears will be fabricated from net forged rather than cut differential gears. There should be no effect on test severity. The TF asked Dana to confirm and verify that the entire batch build is using net forged and not a mixture of the gear type production processes. **Note:** Dana subsequently confirmed that all net forged gears were being used in this build.

The gear sets are expected to arrive from Ft. Wayne on 12/10 and Lugoff plans to start assembly of the axles on 12/12. Estimate is that it will take about 2 weeks to assemble our gears. The plan will be to conduct assembly on one shift rather than over two shifts per day. The final count of gear sets being shipped after the production process is lower than the 1470 that were ordered. The shortage is approximately 5% of the total gear sets ordered. The labs were share in the reduction based on a percentage of axles that each lab ordered.

The higher cost carriers should be used in assembling the axles. Dana was asked to confirm (and did so) that the carriers being used for this build were the ones machined in the one-step CNC process.

Mr. Ottley maintains documentation of special requirements for the ASTM axle set. He will update any missing requirements into a new "special" drawing set and make those available to the ASTM committee. He confirmed that the Dana build specification of break/turn is 0.005 to 0.009 thousandths and tolerance range on backlash is 20-40 in-lbs torque to rotate.
The TF restated that the target for contact pattern when building the axles is L2FO or L3F0 with L2F-1 and L2F+1 or L3F-1 and L3F+1 being acceptable tolerance. Bunched toe patterns are unacceptable. The goal is from the majority of the axles to L2F0. Mr. Bartlett was tasked with providing the Dana pattern contact information to Mr. Ottley that had previously been provided to the panel by Mr. Okamuro. The contact pattern charts previously provided by Dana are included as ***Attachment # 2***.

Because of concerns with non-lubrited axles rusting over time, the TF requested that Dana use a mist of oil as specified by engineering to be sprayed in the axles as they are assembled to provide corrosion resistance. Dana will check to see what type of oil was used during the previous assembly process at Statesville and use the same oil for this next batch. ***Attachment # 3*** details all the subsequent communication and corrosion resistant oil information received was subsequently used.

Dana agreed to document backlash, running torque, and gear pattern in a spreadsheet for the entire batch build as well as note the information on the axle housing for quick reference by the labs. Dana will also document a rework percentage record for this batch of axles. The documentation for both was subsequently provided and is included as ***Attachment # 4.*** In quick summary, all 1402 axles represented lengthwise patters of L2 (no L3). There were 10 reject adjustments (< 1%). Flank F+1 count was 43 (3%). Flank F-1 count was 75 (5%). Flank F0 represented approximately 92 percent of the axles assembled. This is representative of the 2004 non-lubrited axle order.

The TF discussed the concern/desire for Dana to be sure that the inner pinion bearing is not over packed with grease to the point where excess grease gets into the axle and contaminates the test oil. Dana commented that there usual practice/customer request is to install extra grease. There were some instances of some inconsistencies that were observed in the 2004 non-lubrited batch inner pinion bearing greasing technique. ***Attachment # 5*** documents information previously submitted by Mr. Okamuro documenting the assembly tool/process used by Statesville and Morganton assembly facilities. He confirmed that the grease used is Chevron Dura-Lith Grease EP NLGI 2. The TF request is for the grease to be packed into the bearing in a "sparing manner". A note is to be added to the drawings stating that grease is to be added in a sparing manner.

The TF requested that when palleting the axles for shipment, Dana should use four pallets (one for each lab) and then place the finished axles in sequence on the four pallets to ensure an even rotating mix of axles to the labs throughout the entire build. ***Attachment #6*** further details L-37 Axle Assembly Requirements provided by Mr. Ottley and further description of the pallet rotation process we requested.

Due to the holiday season scheduling and limited staffing at all facilities, Dana agreed to contact each lab at the time the completed axles are shipped. This will help ensure that someone is present at each facility to receive the axles.
Shipping contacts at the various labs are as follows:

Brian Koehler at SWRI
Cory Koglin at Afton
Dale Smith at PARC
Don Bartlett at Lubrizol

Below details the axles ordered/axle ship count subsequently provided by Dana. Axles shipped the week of December 19.

	Axles Ordered	Axles Shipped
Afton	450	427
Lubrizol	400	380
Parc	220	209
SwRI	300	286
Total	1470	1402

A facility tour of the axle build area and processes followed our discussions. It was a great opportunity to see how the new line was laid out, visit with several of the technicians at various points of the assembly, and provided a better understanding of many of the processes we had just talked about.

The Hardware TF would like to take the opportunity to thank the Lugoff facility group for their hospitality, time taken time out of their busy schedules to meet with us and their open, sharing, detailed discussion, and a strong desire to help us better understand their gear production processes and the opportunity to communicate our needs to them. Also, thank you for the lunch that was brought in.

The visit was adjourned at 1:18 p.m.

Subsequent to this meeting, the following attachments detail follow up information provided by Dana:

Attachment # 7 - Mr. Miller's summary report of his documentation of the 060GA105X diff build at Lugoff dated December 12, 2005.

Attachment # 8 - Mr. Kreinbring provided specific drawings related to the Dana Model 60 that could be shared with the panel for documentation purposes.

Respectfully submitted,

Donald T. Bartlett

Donald T. Bartlett,
L-37 Surveillance Panel Chairman

Lugoff 12/8/05 A

Dana Corporation
Heavy Vehicle Technology and Systems Group
1235 Commerce Drive Lugoff, South Carolina 29078

Process Sheet

Title: ASTM-Axle Assembly		Work Instruction PS0203 Revision: 1
Department: Axle Area: Light Axle	*Approved & Released Process Sheet*	Implementation Date: 08/10/2005
Type of Document: Light Axle Process Standard Element: QS-9000 Standard Elements - 4.09.1 Process Monitoring and Operator Instructions		Review Period - 364 Days

1.0 Purpose:
The purpose of this document is to instruct operators on the requirements of building the ASTM axles for the Light Axle line.

2.0 Scope:
The scope of this document covers the build up of the ASTM axles for the Light Axle line.

3.0 Responsibilities:

Attachment 1
Page 1 of 4
Reference L-371F

4.0 Definitions:
ASTM - American Society for Testing and Materials

5.0 Work Instruction Steps:
5.1 Build the total order continuously without interruption.
NOTE: Use only the carrier lot designated for this order.

5.2 Stamp the cover plate surface of the housing with the date and shift identification (ie **127-04A** were "**127**" is the Julian date "**04**" is the year and "**A**" is the shift).

5.3 Use the pattern position chart to evaluate the ring and pinion contact pattern. Shim to optimize the drive side pattern.
NOTE: Accept **ONLY** patterns designated by Engineering.

5.4 Mark the torque to rotate, backlash, and pattern on housing (ie L2F0).

5.5 Before installing the cover, mist the inside of the housing with oil to help prevent rust. Spray, mainly, the pinion head, ring gear, and differential gears. minimize grease
NOTE: Engineering will specify what oil to use.

5.6 When painting, do **NOT** paint over the markings.

5.7 After painting, divide the axles as they come out, randomly, between the labs. This may be done one pallet at a time. (ie one pallet for Lubrizol, the next for Ethyl, the next for Southwest Research, then repeat the sequence).
NOTE: Do **NOT** fill one lab's order and then start on the next order.

5.8 Packaging is to consist of 16 axles per pallet, with the outside measurement of a loaded pallet not to exceed **60" high, 53" deep, and 63" wide.**

5.9 Place a tag on each pallet with the heat code identification of the ring and pinion.

6.0 Safety & Environmental Information:

6.1 Always wear proper PPE (safety glasses, steel-toe shoes, and gloves).

6.1.1 Wear safety glasses to avoid injury from flying objects such as metal shavings or debris.

6.1.2 Safety shoes to protect harm from falling heavy objects/parts.

6.1.3 Wear gloves to protect against cutting metal shavings or splinters from handling dunnage.

6.2 Practice good housekeeping skills-clean up dunnage and place in proper disposals once use is
completed.

6.3 Ensure hands and body are completely cleared from all operations before operation is engaged.

7.0 Associated Documents:

8.0 Document Revision History:

Revision: 1	**Date Created:** 07/11/2005 **Date of Last Revision:** 08/10/2005	**Last Approval Date:** 08/10/2005

Document Author: Michele Mitchum	Document Manager: Brian Boone

9.0 Reason for Change:

Revision:	Sec/Para Changed	Change Made:	Date
1	N/A	Initial Issue of Document	07/11/05

10 Notification List:

Brian Boone
Mark Robosson
Derek Ottley

Attachment 1
Page 2 & 4
Reference L-37E

11.0 Approvals:

First Approver's Signature

Name: Randall Martin

Aug 10, 2005 12:15:37 PM EDT - Approved by: Randall Martin/HVTSG/Dana

Lugoff
12/8/05

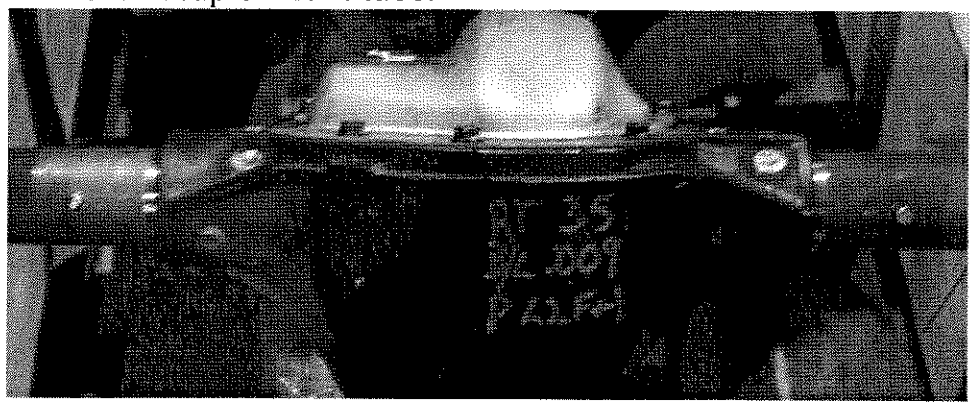
C

Light Axle Pre-Paint Inspection
Part Number: 060AA100-2

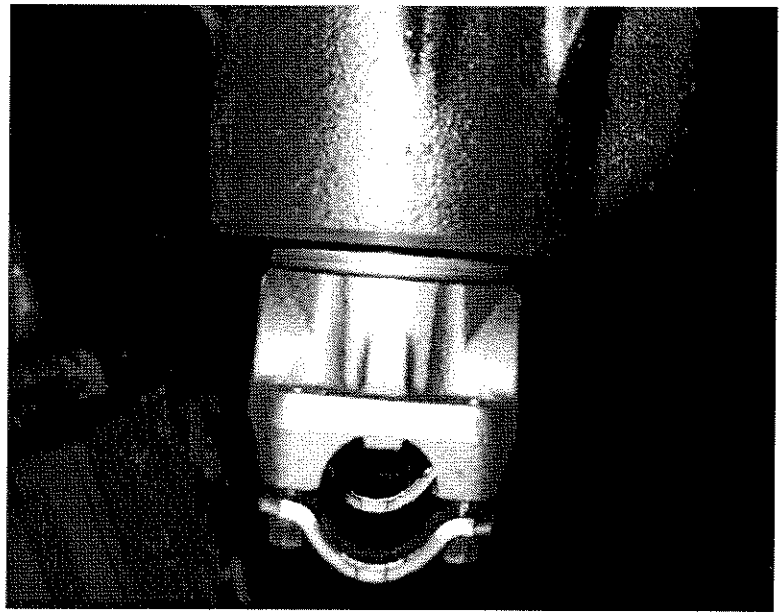
1. Oil plug tight (recessed type).

2. Ratio 5.86 (41-7).

3. Dead plug on R.H. tube.
   Vent w/cap on L.H. tube.

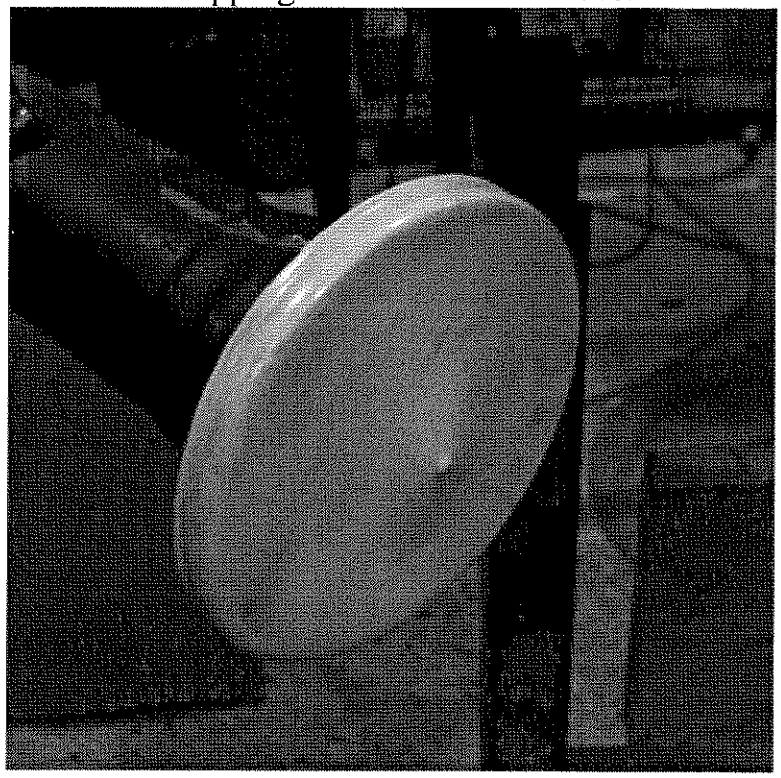


4. End Yoke 2-4-3791-1



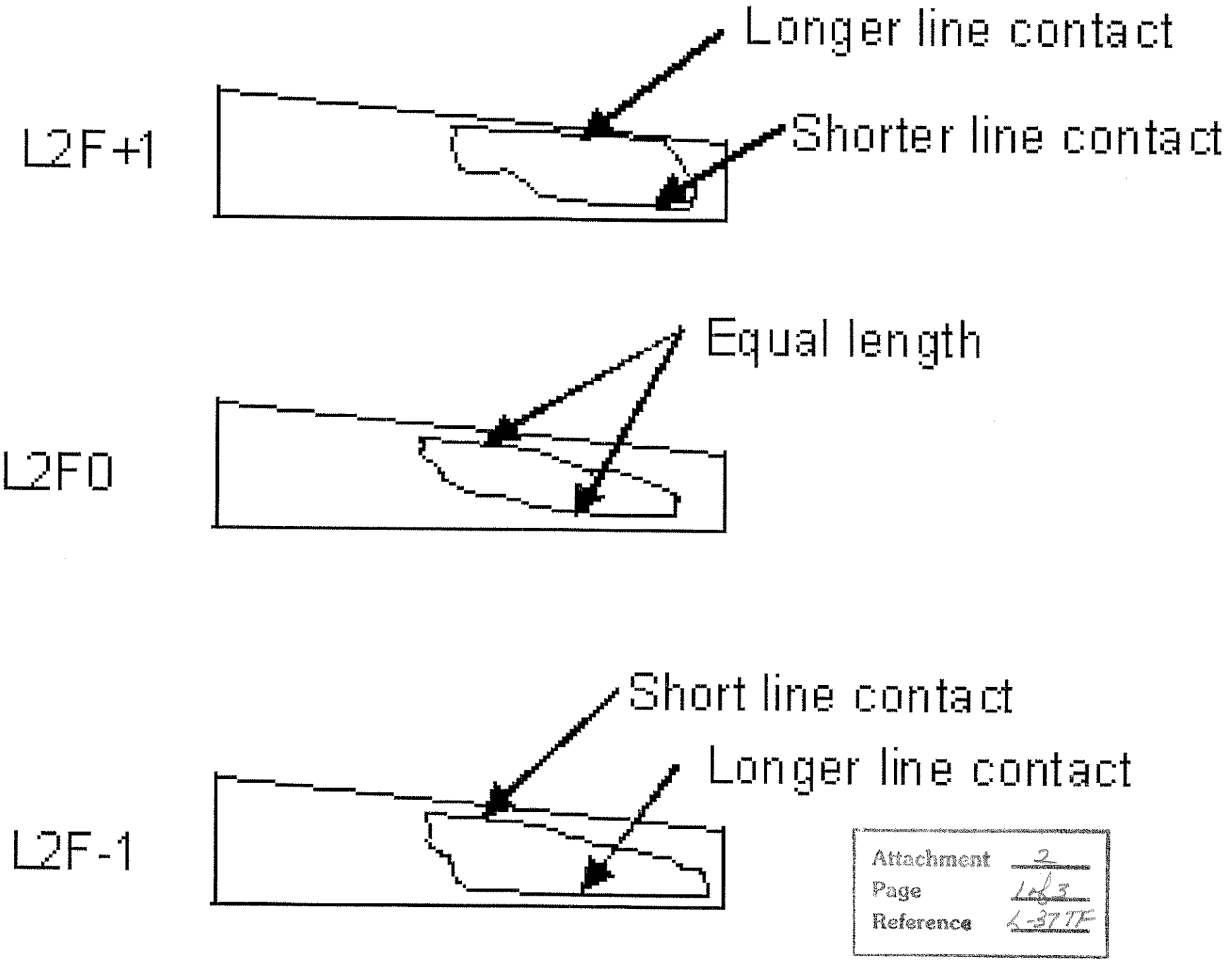
Attachment 1
Page 3 of 4
Reference A-37TF

5. Plastic shipping cover on end of tubes.



6. Information recorded on carrier should not be painted.

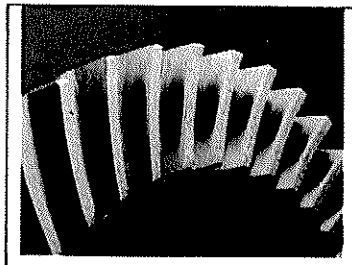
USED DURING 2004 NON-LUDERITZ BIRDS



Attachment 2
Page 1 of 2
Reference L-37TF

ACCEPTABLE

L2



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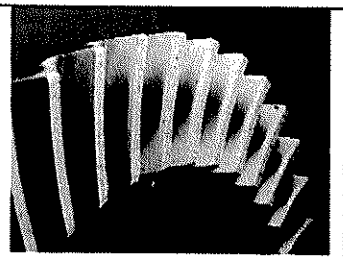

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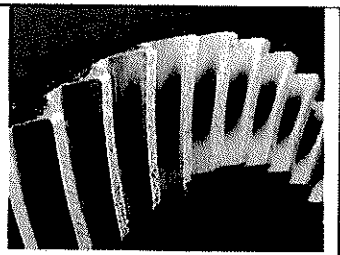

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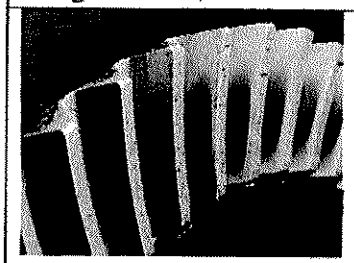

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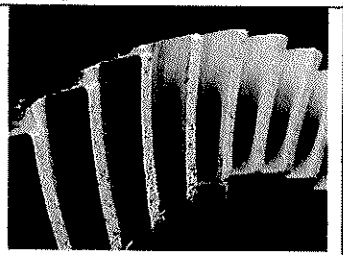

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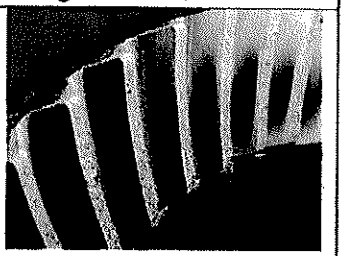

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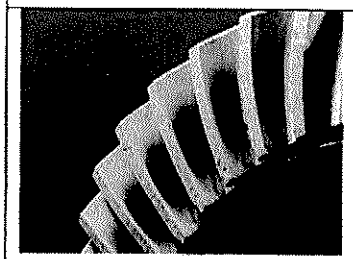

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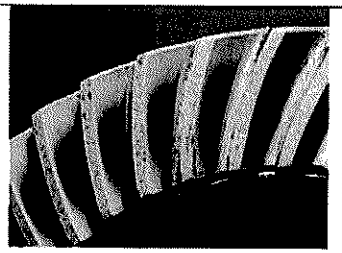

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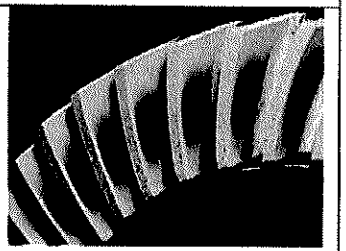

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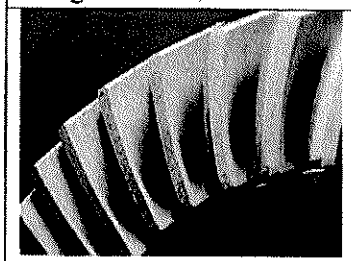

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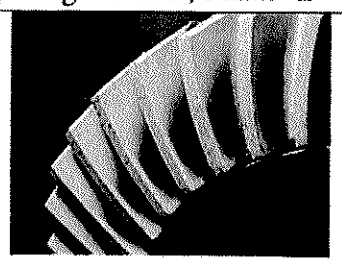


Lengthwise **2**, Flank **-1**

Lengthwise **2**, Flank **+1**

TOOTH CONTACT PATTERN ACCEPTABILITY CHART SHEET NO. 1

Visual Acceptability Standards

Hard Test @ Etch Pinion Position With **.005**" to **.0055**" Actual Backlash
Assembly @ Etch Pinion Position With **.005**" to **.008**" Actual Backlash
Note* The lowest backlash reading is the actual backlash.

Attachment 2
Page 24 3
Reference L-37TF

Drive Side (Gear Convex)

Length of Pattern: ¾ of Tooth (Max.)

Lengthwise Position: **Central (3)** or **Central Toe (2)**

Profile (Flank) Position: **Flank In 0.001**" to **Flank Out 0.001**"

Optimum Goal: *Central (3) Lengthwise Position*
Square (0) Flank Position

Coast Side (Gear Concave)

Length of Pattern: ¾ of Tooth (Max.)

Lengthwise Position: **Central (3)** or **Central Toe (2)**

Profile (Flank) Position: **Flank In 0.001**" to **Flank Out 0.001**"

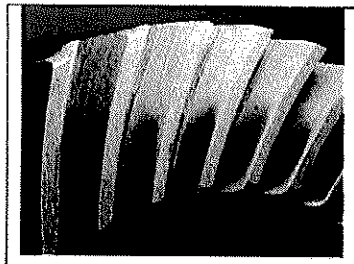
Optimum Goal: *Central (3) Lengthwise Position*
Square (0) Flank Position

Lame or Reverse Lame is Acceptable.

Lame = Coast Side is Flanked Out in Relation to the Drive Side
Reverse Lame = Coast Side is Flanked In to the Drive Side

Gear Quality Approval By: Duane DeVaux 10-19-98

UNACCEPTABLE



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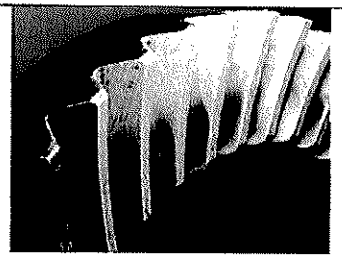

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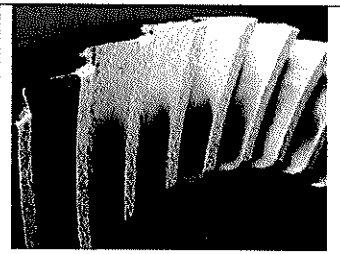

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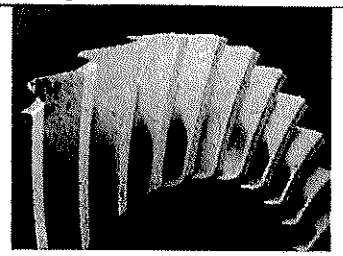
Bunched Toe, Flank **0**



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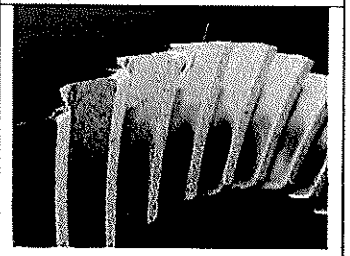
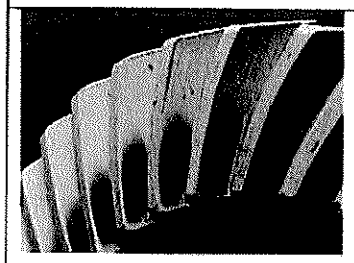


Bunched Toe, Flank **+1**



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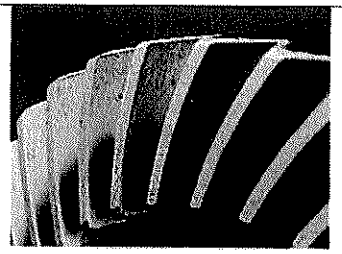

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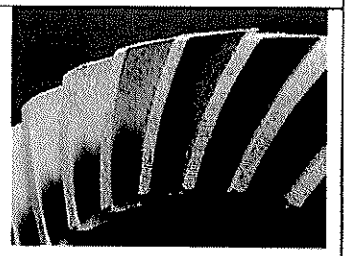

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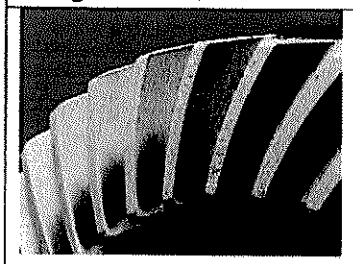

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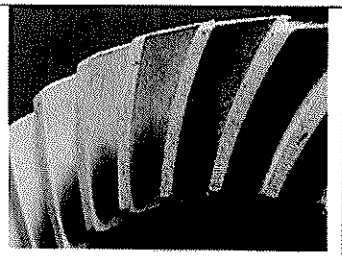

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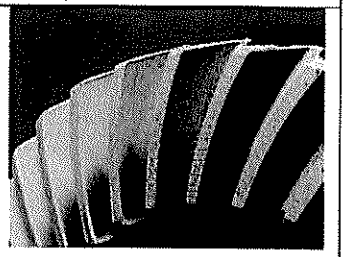


Bunched Toe, Flank **+1**

TOOTH CONTACT PATTERN ACCEPTABILITY CHART SHEET NO. 2

Visual Acceptability Standards

Hard Test @ Etch Pinion Position With **.005**" to **.0055**" Actual Backlash
Assembly @ Etch Pinion Position With **.005**" to **.008**" Actual Backlash
Note* The lowest backlash reading is the actual backlash.

Attachment 2 Page 3 of 3 Reference L-377F

Drive Side (Gear Convex)

Length of Pattern: ½ of Tooth (Max.)

Lengthwise Position: **Bunched Toe 0.002" Max** to **Toe (1)**

Profile (Flank) Position: **Flank In 0.001**" to **Flank Out 0.001**"

Optimum Goal: *Bunched Toe 0.002" Lengthwise Square (0) Flank Position*

Coast Side (Gear Concave)

Length of Pattern: ½ of Tooth (Max.)

Lengthwise Position: **Bunched Toe 0.002" Max** to **Toe (1)**

Profile (Flank) Position: **Flank In 0.001**" to **Flank Out 0.001**"

Optimum Goal: *Bunched Toe 0.002" Lengthwise Square (0) Flank Position*

Lame or Reverse Lame is Acceptable.

Lame = Coast Side is Flanked Out in Relation to the Drive Side
Reverse Lame = Coast Side is Flanked In to the Drive Side

Gear Quality Approval By: Duane DeVaux 10-19-98

Bartlett, Donald

From: Brian Koehler [bkoehler@swri.org]

Sent: Wednesday, December 14, 2005 9:14 AM

To: Bartlett, Donald; dml@astmtmc.cmu.edu; dsmith@parctech.com; Koglin, Cory

Cc: Kampe, Peter; Schenkenberger, Chris; don.kreinbring@dana.com; lou.pappademos@dana.com; bruce.hall@dana.com; derek.ottley@dana.com; steve.bird@dana.com; craig.jones@dana.com

Subject: RE: Dana Model 60 Axle Build/Brian Koehler

I am OK with the buildup oil picked. All axles in the batch must be treated equally with the same oil. We will still do our pre-test cleaning. The oil choice may be even more acceptable if we can say that Dana has used this product before in axle production.

Regards,
Brian P. Koehler
Principal Engineer
Southwest Research Institute
P.O. Drawer 28510, Zip: 78228-0510
9503 West Commerce, Zip: 78227
San Antonio, TX USA
Building 209
Tel: 210-522-3588
Fax: 210-684-7523
Cell: 210-213-2761

-----Original Message-----
From: Bartlett, Donald [mailto:DTB@lubrizol.com]
Sent: Wednesday, December 14, 2005 6:16 AM
To: bkoehler@swri.edu; dml@astmtmc.cmu.edu; dsmith@parctech.com; Koglin, Cory
Cc: Kampe, Peter; Schenkenberger, Chris; don.kreinbring@dana.com; lou.pappademos@dana.com; bruce.hall@dana.com; derek.ottley@dana.com; steve.bird@dana.com; craig.jones@dana.com
Subject: Dana Model 60 Axle Build at Lugoff Update

FYI...to get/keep the communication trail moving:

I have had several discussions with Don and Derek this week.

Don and Derek:

1) Indicated that the axle builds commenced on Monday afternoon. The choice was to use this oil (see above PDF information) to mist the gears after assembly to protect them from future rusting or use nothing. Dana was unable to determine what was used previously at Statesville. So this is what Dana decided to use.
2) We are unsure of the final count of ring and pinions as Lugoff are still receiving shipments from Ft. Wayne. Can one of you contact Ft. Wayne and confirm the final count for our records and decision before shipping any axles?
3) If I understand right/please confirm, the Parc order (250) will ship once the four pallet build process finishes their order, then SwRI (300), LZ (400), Afton (450). But we do need to determine the final count before the first axles ship so that if there is a shortage, each lab will receive the appropriate reduction percent per axles they ordered.
4). Please do contact the respective lab representative we provided at our meeting before shipping the axles so that each lab can confirm that someone will be available to receive the axles through the holiday season.

I am close to completing the minutes of both the Ft. Wayne and Lugoff facility visits.

Again, we appreciate the communication and efforts to meet our requested needs. Our thanks to the hospitality of

Dana for both of our visits.

Best regards,

Donald T. Bartlett

The Lubrizol Corporation

29400 Lakeland Blvd, Mail Drop 121C

Wickliffe, Ohio 44092

e-mail: dtb@lubrizol.com

phone: 440-347-2388

fax: 440-347-2878

Mobile: 440-220-0843

From: Don.Kreinbring@dana.com [mailto:Don.Kreinbring@dana.com]
Sent: Tuesday, December 13, 2005 4:25 PM
To: Derek.Ottley@dana.com; Bartlett, Donald
Subject: Fw: Osyris 210 S technical information

FYI.

Don Kreinbring
Current Product Engineering
Spicer Off-Highway Products Division
(269) 567 - 1140 phone/fax
don.kreinbring@dana.com

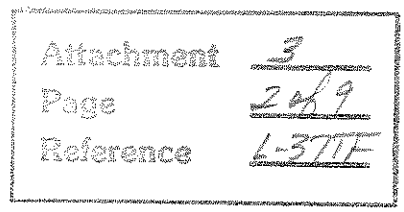
----- Forwarded by Don Kreinbring/CVSD/Dana on 12/13/2005 04:22 PM -----

"Cathy Bellomo" <Cathy.Bellomo@total-us.com>

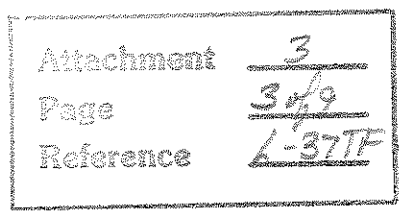
12/13/2005 02:04 PM

To <don.kreinbring@dana.com>
cc
Subject Osyris 210 S technical information

Cathy Bellomo
Chemist



TOTAL Lubricants USA Inc.
5 North Stiles Street
Linden, NJ 07036
phone 908-862-9300 ex 5041
fax 908-862-3950
cathy.bellomo@total-us.com



TOTAL

PRODUCT INFORMATION

OSYRIS 210 S
RUST PREVENTIVE AND SLUSHING OIL

(Formerly Protera 210)

DESCRIPTION

OSYRIS 210 S is a light viscosity petroleum-based rust preventive. It is designed for protection of metal surfaces in industrial applications. OSYRIS 210 is a non-drying oil which can be easily applied using brush, roller, or spray systems. Its light residual oil film can be easily removed with mineral spirits.

OSYRIS 210 S is designed to provide rust protection to steel sheets, coils, and bar stock, and can also be used as a "slushing" or "mothballing" oil in engines prior to actual service.

TYPICAL SPECIFICATIONS

Appearance	Light Pale Liquid
Odor	Mild Petroleum Type
Color, ASTM D-1500	1.0
Viscosity @ 40C, cSt	28
Flash Point, COC, F	405
Fire Point, COC, F	430
Specific Gravity @ 60/60 F	0.866
Density @ 60 F	7.21

Attachment 3
Page 1 of 1
Reference L-37IF

Revised 9/24/01 WHC

Cathy Bellomo
Chemist
908-862-9300 X 5041

Product data sheet

TOTAL Lubricants USA, Inc.

Linden, NJ 07036
5 North Stiles Street
908.862.9300 800.526.4127

Rockingham, NC 28379
709 Airport Road
800.323.3198

Knoxville, TN 37914
3315 Riverside Drive
800.323.3198

MATERIAL SAFETY DATA SHEET FOR OSYRIS 210 S

TOTAL Lubricants USA, Inc.
Airport Road
Rockingham NC 28379-1058

REVISION DATE
28-OCT-04

DATE ISSUED
13-DEC-05

IDENTIFICATION AND EMERGENCY INFORMATION

PRODUCT NAME:
OSYRIS 210 S

PRODUCT #:
200905

CHEMICAL NAME:
N/A - Mixture

CAS #'S:
Mixture

PRODUCT APPEARANCE AND ODOR:
Amber liquid, petroleum odor

CHEMICAL FAMILY:
Petroleum hydrocarbon

SYNONYMS:
Lubricating Oil

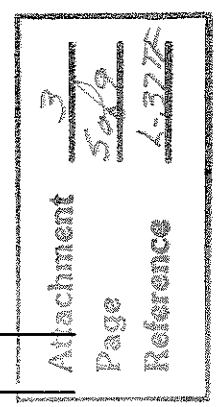
EMERGENCY TELEPHONE:
910-997-5086

COMPONENTS AND HAZARD INFORMATION

COMPONENTS:	W/W	HAZARD DATA (TLV, LD50, LC50, ETC.):
Petroleum-based lubricating oil		TLV 5 mg/meter cubed
CAS #'S	64742-65-0 or 64742-54-7 ; and 64742-58-1 and 64742-62-7	(as an oil mist)
Proprietary additives		

HAZARDOUS MATERIALS IDENTIFICATION SYSTEM (HMIS):

Health	Flammability	Reactivity
1	1	0



TRANSPORTATION INFORMATION

TRANSPORTATION/SHIPPING INFORMATION:

Department of Transportation (DOT): Not regulated

EMERGENCY FIRST AID

EYE CONTACT:
If splashed into the eyes, flush with clear water for 15 minutes or until irritation subsides. If irritation persists, call a physician.

SKIN CONTACT:
In case of skin contact, remove contaminated clothing and wash skin thoroughly with soap and water.

INHALATION:
Vapor pressure is very low. Vapor inhalation under ambient conditions is normally not a problem. If overcome by vapor from hot product, immediately remove from exposure and call a physician. If breathing is irregular or has stopped, start resuscitation; administer oxygen if available. If overexposure

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EMERGENCY FIRST AID

to oil mist, remove from further exposure until excessive oil mist condition subsides.
INGESTION:
If ingested, do not induce vomiting. Call a physician immediately.

FIRE AND EXPLOSION HAZARD INFORMATION

FLASH POINT (MINIMUM):
191'C (375'F) Test method: COC

AUTOIGNITION TEMPERATURE:
N/E

NATIONAL FIRE PROTECTION ASSOCIATION (NFPA) - HAZARD IDENTIFICATION:

Health	Flammability	Reactivity
1	1	0

FLAMMABLE OR EXPLOSIVE LIMITS (approximate percent by volume in air):
Estimated values: lower: N/E upper: N/E

EXTINGUISHING MEDIA AND FIRE FIGHTING PROCEDURES:
Foam, water spray (fog), dry chemical, carbon dioxide and vaporizing liquid type extinguishing agents may all be suitable for extinguishing fires involving this type product, depending on size or potential size of fire and circumstances related to the situation. Water or foam may cause frothing.
Use water to keep fire-exposed containers cool. Water froth may be used to flush spills away from exposure. Minimize breathing gases, vapor, fumes, or decomposition products. Use supplied-air breathing equipment for enclosed or confined spaces or as otherwise needed.

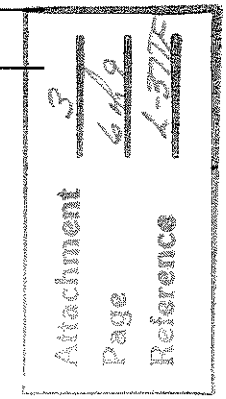
UNUSUAL FIRE AND EXPLOSION HAZARDS:
n/a

"EMPTY" CONTAINER WARNING:
Empty containers retain residue (liquid or vapor) and can be dangerous. DO NOT PRESSURIZE, WELD, CUT BRAZE, SOLDER, DRILL, GRIND OR EXPOSE SUCH CONTAINERS TO HEAT, FLAME, SPARKS, OR OTHER SOURCES OF IGNITION; THEY MAY EXPLODE AND CAUSE INJURY OR DEATH. Do not attempt to clean since residue is difficult to remove. "Empty" drums should be completely drained, properly bunged, and returned to a drum reconditioner. All other containers should be disposed of in an environmentally safe manner and in accordance with government regulations.

HEALTH AND HAZARD INFORMATION

EXPOSURE LIMIT FOR TOTAL PRODUCT: Monitor data listed in the Components and Hazard Information section.

VARIABILITY AMONG INDIVIDUALS:
Health studies have shown that many petroleum hydrocarbons and synthetic lubricants pose potential human health risks which vary from person to person. As a precaution, exposure to liquids, vapors, mists, or fumes should be minimized.



MATERIAL SAFETY DATA SHEET FOR OSYRIS 210 S

TOTAL Lubricants USA, Inc.
Airport Road
Rockingham NC 28379-1058

REVISION DATE
28-OCT-04

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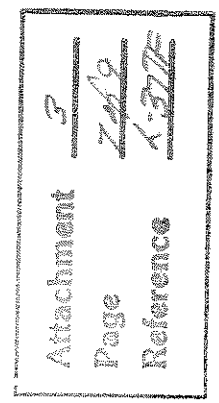
HEALTH AND HAZARD INFORMATION

EFFECTS OF OVEREXPOSURE (Signs and symptoms of exposure):
Prolonged or repeated skin contact with this product tends to remove skin oils possibly leading to irritation and dermatitis.
Product contacting the eye may cause irritation.
Product has a low order of oral and dermal toxicity.
Possible aspiration hazard.
Induced vomiting may cause aspiration of product into the lungs.
(See Emergency First Aid Section).

PHYSICAL DATA

The following data are approximate or typical values and should not be used for precise design purposes.



BOILING RANGE:
Wide range

VAPOR PRESSURE:
< 0.1 @ 38°C/100°F

SPECIFIC GRAVITY (25°C/25°C):
(WATER = 1)
< 1.0

VAPOR DENSITY (AIR = 1):
> 8

MOLECULAR WEIGHT:
Wide range

PERCENT VOLATILE BY VOLUME:
Negligible

EVAPORATION RATE @ 1 ATM. AND 25°C (77°F) (n-BUTYL ACETATE = 1):
< 1.0

SOLUBILITY IN WATER @ 1 ATM. and 25°C (77°F):
Negligible

POUR, CONGEALING OR MELTING POINT:
n/e

FREEZING POINT:
n/e

REACTIVITY

This product is stable and will NOT react violently with water. Hazardous polymerization will not occur. Avoid contact with strong oxidants such as liquid chlorine, concentrated oxygen, sodium hypochlorite or calcium hypochlorite, etc., as this represents a serious explosion hazard.

DECOMPOSITION PRODUCTS UNDER FIRE CONDITIONS:
Fumes, smoke, carbon monoxide, oxides of sulfur, and other decomposition products, in case of incomplete combustion.

CONDITIONS TO AVOID:
Open flames.

TOXICITY

ORAL (Acute)	N/E
DERMAL (Acute)	N/E
EYE	N/E

MATERIAL SAFETY DATA SHEET FOR OSYRIS 210 S

TOTAL Lubricants USA, Inc.
Airport Road
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REVISION DATE
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TOXICITY

INHALATION (Acute) N/E
CHRONIC, SUBCHRONIC, ETC. N/E
Medical Conditions Aggravated by Exposure: Unknown
This product does NOT contain any ingredients identified as carcinogenic by IARC, NTP, or OSHA.
All components known to be contained in this product are on the TSCA inventory or are exempt.
SARA Section 313 Status: This material is not known to contain any chemicals on the SARA Section 313 list at a concentration greater than 1.0 percent or carcinogenic chemical on that list at a concentration greater than 0.1 percent.

SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED:
Keep product out of sewers and watercourses by diking or impounding. Absorb with sand or inert material. Sweep or scoop up and remove. Prevent spread of spill. Advise authorities if product has entered or may enter sewers, watercourses or extensive land areas. Assure conformity with local regulations.

WASTE DISPOSAL METHOD: (Consult federal, state, or local authorities for proper disposal procedures.)
Assure conformity with applicable disposal regulations. Dispose of absorbed material at an approved waste site or facility.

PROTECTION AND PRECAUTIONS

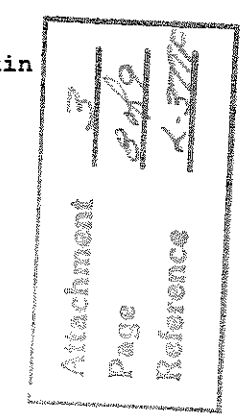
VENTILATION: (Always maintain below permissible exposure limits.)
Use local exhaust to capture vapor, mist or fumes, if necessary.
Provide ventilation sufficient to prevent exceeding recommended exposure limit or buildup of explosive concentrations of vapor in air.

RESPIRATORY PROTECTION: (Use only NIOSH approved equipment.)
Normally not needed at ambient temperatures. Use supplied air respiratory protection in confined or enclosed spaces, if needed. Use filter, dust, fume, or mist respirator type under misting conditions. Use can or cartridge; gas or vapor respirator type under conditions exceeding TWA standard.

PROTECTIVE GLOVES:
Use chemical-resistant gloves, if needed, to avoid prolonged or repeated skin contact.

EYE PROTECTION:
Use splash goggles or face shield when eye contact may occur.

OTHER PROTECTIVE EQUIPMENT:
Use chemical-resistant apron or other impervious clothing, if needed, to avoid contaminating regular clothing which could result in prolonged or repeated skin contact.



MATERIAL SAFETY DATA SHEET FOR OSYRIS 210 S

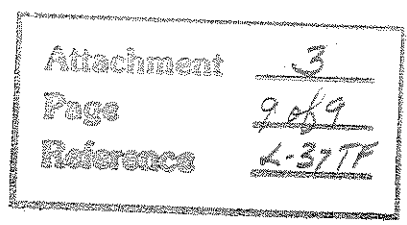
TOTAL Lubricants USA, Inc.
Airport Road
Rockingham NC 28379-1058

REVISION DATE	DATE ISSUED
28-OCT-04	13-DEC-05

PROTECTION AND PRECAUTIONS

WORK PRACTICES/ENGINEERING CONTROLS:
Keep containers closed when not in use. Do not handle near heat, sparks , flame or strong oxidants.
PERSONAL HYGIENE:
Minimize breathing vapor, mist, or fumes. Avoid prolonged or repeated contact with skin. Remove contaminated clothing; launder or dry-clean before reuse. Remove contaminated shoes and thoroughly clean before reuse; discard if oil-soaked. Cleanse skin thoroughly after contact, before breaks and meals, and at end of work period. Product is readily removed from skin by waterless hand cleaners followed by washing thoroughly with soap and water.

PREPARED BY: REGULATORY MANAGER



Attachment 4
Page 1 of 44
Reference L-37 II

ASTM L-37 Axle Assembly

Dana P/N: 060AA100-2 Ring Gear/Pinion Heat Code: **P4L792/V1L417**
Assembly Date: Dec-05

	Torque-To-Rotate (in.lbs)	*Backlash (inches)*	*Contact Pattern - Drive Side*	**Rework** *(Check only, where app.)*
1.	45	.005	L2F0	
2.	40	.005	L2F0	
3.	40	.007	L2F0	
4.	35	.009	L2F0	
5.	45	.008	L2F0	
6.	40	.007	L2F-1	
7.	40	.009	L2F0	
8.	40	.005	L2F-1	
9.	35	.009	L2F0	
10.	30	.008	L2F0	
11.	20	.010	L2F0	
12.	40	.005	L2F0	
13.	35	.007	L2F0	
14.	30	.010	L2F0	
15.	40	.009	L2F0	
16.	35	.007	L2F0	
17.	40	.009	L2F-1	
18.	40	.007	L2F0	
19.	40	.008	L2F0	
20.	35	.008	L2F0	
21.	25	.008	L2F0	
22.	40	.009	L2F0	
23.	35	.007	L2F0	
24.	20	.007	L2F-1	
25.	35	.010	L2F0	
26.	35	.009	L2F0	
27.	30	.009	L2F0	
28.	35	.008	L2F0	
29.	30	.008	L2F0	
30.	40	.008	L2F+1	

ASTM L-37 Axle Assembly

Dana P/N: 060AA100-2 Ring Gear/Pinion Heat Code: **P4L792/V1L417**
Assembly Date: Dec-05

	Torque-To-Rotate (in.lbs)	*Backlash (inches)*	*Contact Pattern - Drive Side*	**Rework** *(Check only, where app.)*
31.	30	.008	L2F0	
32.	30	.010	L2F0	
33.	40	.009	L2F0	
34.	35	.008	L2F0	
35.	30	.009	L2F0	
36.	25	.009	L2F+1	
37.	40	.006	L2F+1	
38.	35	.006	L2F0	
39.	40	.010	L2F0	
40.	40	.007	L2F0	
41.	35	.008	L2F0	
42.	35	.005	L2F0	
43.	35	.009	L2F0	
44.	25	.008	L2F0	
45.	30	.009	L2F0	
46.	40	.007	L2F0	
47.	35	.009	L2F0	
48.	40	.006	L2F+1	
49.	35	.006	L2F0	
50.	35	.007	L2F0	
51.	35	.008	L2F0	
52.	40	.006	L2F0	
53.	45	.004	L2F0	
54.	40	.005	L2F0	
55.	25	.006	L2F0	
56.	40	.006	L2F0	
57.	40	.007	L2F0	YES
58.	35	.008	L2F0	
59.	40	.006	L2F0	
60.	35	.005	L2F0	

ASTM L-37 Axle Assembly

Dana P/N: 060AA100-2 Ring Gear/Pinion Heat Code: **P4L792/V1L417**
Assembly Date: Dec-05

	Torque-To-Rotate (in.lbs)	*Backlash (inches)*	*Contact Pattern - Drive Side*	**Rework** *(Check only, where app.)*
61.	35	.006	L2F0	
62.	30	.009	L2F0	
63.	30	.008	L2F-1	
64.	30	.007	L2F0	
65.	25	.008	L2F0	
66.	25	.008	L2F0	
67.	40	.009	L2F0	
68.	35	.009	L2F-1	
69.	30	.009	L2F0	
70.	35	.010	L2F+1	
71.	35	.010	L2F0	
72.	35	.005	L2F0	
73.	35	.009	L2F-1	
74.	35	.005	L2F0	
75.	40	.008	L2F0	
76.	40	.006	L2F0	
77.	40	.009	L2F0	
78.	25	.008	L2F0	
79.	25	.005	L2F0	
80.	30	.008	L2F-1	
81.	40	.008	L2F-1	
82.	35	.006	L2F0	
83.	30	.005	L2F0	
84.	35	.006	L2F0	
85.	40	.007	L2F0	
86.	40	.007	L2F0	
87.	35	.008	L2F0	
88.	35	.007	L2F0	
89.	36	.006	L2F0	
90.	45	.006	L2F0	

ASTM L-37 Axle Assembly

Dana P/N: 060AA100-2 Ring Gear/Pinion Heat Code: **P4L792/V1L417**
Assembly Date: Dec-05

	Torque-To-Rotate (in.lbs)	*Backlash (inches)*	*Contact Pattern - Drive Side*	**Rework** *(Check only, where app.)*
91.	35	.008	L2F0	
92.	30	.006	L2F0	
93.	40	.009	L2F-1	
94.	30	.008	L2F0	
95.	30	.008	L2F0	
96.	35	.009	L2F0	
97.	25	.006	L2F0	
98.	25	.008	L2F0	
99.	40	.005	L2F0	
100.	30	.005	L2F0	
101.	30	.009	L2F-1	
102.	35	.006	L2F0	YES
103.	30	.008	L2F0	
104.	30	.009	L2F0	
105.	30	.008	L2F-1	
106.	40	.009	L2F0	
107.	25	.006	L2F0	
108.	40	.009	L2F0	
109.	40	.008	L2F-1	
110.	35	.006	L2F+1	
111.	35	.008	L2F0	
112.	25	.009	L2F0	
113.	30	.009	L2F0	
114.	30	.005	L2F0	
115.	35	.008	L2F0	
116.	35	.007	L2F+1	
117.	40	.005	L2F0	
118.	35	.006	L2F0	
119.	40	.005	L2F0	
120.	35	.005	L2F0	

Attachment 4
Page 5
Reference 4377F

ASTM L-37 Axle Assembly

Dana P/N: 060AA100-2 Ring Gear/Pinion Heat Code: **P4L792/V1L417**
Assembly Date: Dec-05

	Torque-To-Rotate (in.lbs)	*Backlash (inches)*	*Contact Pattern - Drive Side*	**Rework** *(Check only, where app.)*
121.	25	.006	L2F0	
122.	25	.007	L2F+1	
123.	30	.007	L2F0	
124.	40	.007	L2F0	
125.	30	.005	L2F0	
126.	30	.007	L2F0	
127.	25	.006	L2F0	
128.	35	.007	L2F0	
129.	30	.009	L2F0	
130.	30	.007	L2F0	
131.	40	.007	L2F0	
132.	30	.007	L2F0	
133.	30	.007	L2F0	
134.	35	.008	L2F0	
135.	35	.008	L2F0	
136.	35	.009	L2F0	
137.	30	.009	L2F0	
138.	25	.009	L2F0	
139.	35	.009	L2F-1	
140.	40	.006	L2F0	YES
141.	30	.007	L2F0	YES
142.	45	.005	L2F0	
143.	40	.009	L2F+1	
144.	35	.006	L2F0	
145.	25	.006	L2F0	
146.	35	.007	L2F0	
147.	35	.006	L2F+1	
148.	30	.005	L2F+1	
149.	35	.005	L2F0	
150.	30	.007	L2F0	

ASTM L-37 Axle Assembly

Dana P/N: 060AA100-2 Ring Gear/Pinion Heat Code: **P4L792/V1L417**
Assembly Date: Dec-05

	Torque-To-Rotate (in.lbs)	*Backlash (inches)*	*Contact Pattern - Drive Side*	**Rework** *(Check only, where app.)*
151.	35	.005	L2F0	
152.	35	.006	L2F0	
153.	40	.006	L2F0	
154.	35	.007	L2F0	
155.	35	.006	L2F0	
156.	30	.005	L2F0	
157.	40	.005	L2F0	
158.	30	.006	L2F0	
159.	30	.006	L2F0	
160.	40	.008	L2F0	
161.	45	.008	L2F0	
162.	30	.008	L2F0	
163.	40	.007	L2F-1	
164.	35	.006	L2F0	
165.	35	.005	L2F0	
166.	40	.009	L2F-1	
167.	35	.008	L2F0	
168.	35	.005	L2F0	
169.	35	.008	L2F0	
170.	40	.006	L2F0	
171.	35	.005	L2F0	
172.	30	.007	L2F0	
173.	40	.007	L2F0	
174.	30	.009	L2F-1	
175.	25	.007	L2F0	
176.	25	.005	L2F0	
177.	40	.009	L2F0	
178.	40	.007	L2F0	
179.	30	.005	L2F0	
180.	40	.005	L2F0	

ASTM L-37 Axle Assembly

Dana P/N: 060AA100-2 Ring Gear/Pinion Heat Code: **P4L792/V1L417**
Assembly Date: Dec-05

	Torque-To-Rotate (in.lbs)	*Backlash (inches)*	*Contact Pattern - Drive Side*	**Rework** *(Check only, where app.)*
181.	30	.009	L2F0	
182.	35	.005	L2F0	
183.	35	.005	L2F0	
184.	25	.005	L2F0	
185.	25	.006	L2F-1	
186.	40	.009	L2F0	
187.	30	.007	L2F0	
188.	20	.005	L2F-1	
189.	25	.005	L2F0	
190.	40	.005	L2F0	
191.	40	.007	L2F0	
192.	40	.006	L2F+1	
193.	35	.006	L2F-1	
194.	25	.009	L2F-1	
195.	30	.009	L2F0	
196.	25	.006	L2F0	
197.	25	.005	L2F0	
198.	25	.005	L2F0	
199.	40	.006	L2F+1	
200.	35	.005	L2F0	
201.	40	.005	L2F0	
202.	30	.005	L2F0	
203.	35	.006	L2F0	
204.	26	.005	L2F0	
205.	30	.005	L2F0	
206.	35	.005	L2F0	
207.	40	.008	L2F+1	
208.	35	.008	L2F0	
209.	40	.007	L2F0	
210.	35	.006	L2F0	

ASTM L-37 Axle Assembly

Dana P/N: 060AA100-2 Ring Gear/Pinion Heat Code: **P4L792/V1L417**
Assembly Date: Dec-05

	Torque-To-Rotate (in.lbs)	*Backlash (inches)*	*Contact Pattern - Drive Side*	**Rework** *(Check only, where app.)*
211.	25	.009	L2F0	
212.	25	.005	L2F0	
213.	30	.006	L2F0	
214.	25	.005	L2F0	
215.	35	.007	L2F0	
216.	25	.007	L2F0	
217.	25	.008	L2F0	
218.	30	.006	L2F0	
219.	40	.005	L2F0	
220.	20	.006	L2F0	
221.	30	.009	L2F0	
222.	25	.008	L2F0	
223.	35	.006	L2F0	
224.	35	.007	L2F+1	
225.	30	.005	L2F0	
226.	40	.009	L2F0	
227.	35	.005	L2F0	
228.	30	.005	L2F0	
229.	30	.008	L2F0	
230.	30	.009	L2F0	
231.	35	.005	L2F-1	
232.	40	.005	L2F0	
233.	35	.005	L2F0	
234.	30	.006	L2F0	
235.	35	.007	L2F0	YES
236.	25	.009	L2F0	YES
237.	35	.009	L2F0	YES
238.	30	.009	L2F0	YES
239.	30	.008	L2F0	YES
240.	40	.009	L2F0	YES

ASTM L-37 Axle Assembly

Dana P/N: 060AA100-2 Ring Gear/Pinion Heat Code: **P4L792/V1L417**
Assembly Date: Dec-05

	Torque-To-Rotate (in.lbs)	*Backlash (inches)*	*Contact Pattern - Drive Side*	**Rework** *(Check only, where app.)*
241.	30	.005	L2F0	
242.	30	.006	L2F0	
243.	40	.007	L2F0	
244.	30	.006	L2F0	
245.	30	.005	L2F0	
246.	30	.005	L2F0	
247.	40	.008	L2F0	
248.	30	.007	L2F0	
249.	30	.008	L2F0	
250.	30	.008	L2F0	
251.	30	.007	L2F0	
252.	40	.005	L2F0	
253.	40	.006	L2F0	
254.	40	.006	L2F0	
255.	40	.006	L2F0	
256.	40	.008	L2F0	
257.	35	.007	L2F-1	
258.	25	.005	L2F0	
259.	25	.006	L2F0	
260.	45	.007	L2F0	
261.	20	.008	L2F0	
262.	35	.006	L2F0	
263.	25	.007	L2F0	
264.	45	.006	L2F0	
265.	35	.007	L2F0	
266.	30	.007	L2F0	
267.	25	.007	L2F0	
268.	35	.007	L2F0	
269.	30	.008	L2F0	
270.	30	.006	L2F0	

ASTM L-37 Axle Assembly

Dana P/N: 060AA100-2 Ring Gear/Pinion Heat Code: **P4L792/V1L417**
Assembly Date: Dec-05

	Torque-To-Rotate (in.lbs)	*Backlash (inches)*	*Contact Pattern - Drive Side*	**Rework** *(Check only, where app.)*
271.	30	.009	L2F0	
272.	35	.009	L2F0	
273.	30	.005	L2F0	
274.	30	.008	L2F0	
275.	25	.009	L2F0	
276.	40	.008	L2F0	
277.	35	.007	L2F0	
278.	35	.008	L2F0	
279.	35	.009	L2F0	
280.	30	.005	L2F0	
281.	25	.009	L2F0	
282.	25	.008	L2F0	
283.	40	.005	L2F0	
284.	25	.009	L2F+1	
285.	45	.009	L2F0	
286.	40	.007	L2F0	
287.	40	.008	L2F0	
288.	25	.007	L2F0	
289.	35	.007	L2F0	
290.	40	.008	L2F0	
291.	25	.008	L2F0	
292.	30	.009	L2F0	
293.	35	.009	L2F0	
294.	35	.009	L2F0	
295.	35	.006	L2F0	
296.	30	.009	L2F0	
297.	25	.007	L2F0	
298.	30	.005	L2F0	
299.	35	.009	L2F0	
300.	25	.008	L2F0	

ASTM L-37 Axle Assembly

Dana P/N: 060AA100-2 Ring Gear/Pinion Heat Code: **P4L792/V1L417**
Assembly Date: Dec-05

	Torque-To-Rotate (in.lbs)	*Backlash (inches)*	*Contact Pattern - Drive Side*	**Rework** *(Check only, where app.)*
301.	40	.007	L2F0	
302.	25	.008	L2F0	
303.	40	.008	L2F0	
304.	45	.005	L2F0	
305.	25	.005	L2F0	
306.	35	.005	L2F0	
307.	40	.006	L2F0	
308.	35	.005	L2F0	
309.	30	.007	L2F0	
310.	30	.007	L2F0	
311.	25	.008	L2F0	
312.	30	.007	L2F0	
313.	35	.005	L2F0	
314.	40	.006	L2F0	
315.	30	.009	L2F0	
316.	30	.009	L2F-1	
317.	35	.006	L2F-1	
318.	35	.009	L2F0	
319.	35	.008	L2F0	
320.	40	.008	L2F0	
321.	35	.006	L2F0	
322.	30	.007	L2F0	
323.	40	.009	L2F0	
324.	30	.006	L2F0	
325.	26	.009	L2F0	
326.	35	.006	L2F-1	
327.	40	.007	L2F0	
328.	25	.005	L2F0	
329.	40	.005	L2F0	
330.	35	.005	L2F0	

ASTM L-37 Axle Assembly

Dana P/N: 060AA100-2 Ring Gear/Pinion Heat Code: **P4L792/V1L417**
Assembly Date: Dec-05

	Torque-To-Rotate (in.lbs)	*Backlash (inches)*	*Contact Pattern - Drive Side*	**Rework** *(Check only, where app.)*
331.	25	.007	L2F0	
332.	35	.009	L2F0	
333.	30	.005	L2F0	
334.	35	.006	L2F0	
335.	25	.009	L2F0	
336.	25	.009	L2F0	
337.	25	.007	L2F0	
338.	25	.007	L2F0	
339.	25	.009	L2F0	
340.	30	.007	L2F0	
341.	40	.007	L2F-1	
342.	30	.008	L2F+1	
343.	25	.007	L2F0	
344.	35	.007	L2F0	
345.	30	.009	L2F0	
346.	30	.007	L2F0	
347.	25	.008	L2F0	
348.	20	.005	L2F0	
349.	35	.006	L2F0	
350.	40	.008	L2F-1	
351.	30	.006	L2F-1	
352.	20	.007	L2F-1	
353.	35	.007	L2F0	
354.	25	.007	L2F0	
355.	25	.008	L2F0	
356.	20	.006	L2F0	
357.	40	.008	L2F0	
358.	35	.006	L2F0	
359.	40	.005	L2F0	
360.	30	.007	L2F0	

ASTM L-37 Axle Assembly

Dana P/N: 060AA100-2 Ring Gear/Pinion Heat Code: **P4L792/V1L417**
Assembly Date: Dec-05

	Torque-To-Rotate (in.lbs)	*Backlash (inches)*	*Contact Pattern - Drive Side*	**Rework** *(Check only, where app.)*
361.	35	.005	L2F0	
362.	40	.007	L2F0	
363.	25	.006	L2F0	
364.	40	.006	L2F0	
365.	35	.007	L2F0	
366.	30	.007	L2F0	
367.	35	.008	L2F0	
368.	30	.008	L2F0	
369.	40	.008	L2F0	
370.	45	.005	L2F0	
371.	40	.005	L2F0	
372.	30	.005	L2F0	
373.	35	.006	L2F0	
374.	30	.006	L2F0	
375.	35	.005	L2F0	
376.	35	.007	L2F0	
377.	25	.008	L2F0	
378.	30	.008	L2F0	
379.	25	.006	L2F0	
380.	30	.008	L2F0	
381.	35	.006	L2F0	
382.	35	.007	L2F-1	
383.	25	.006	L2F0	
384.	25	.007	L2F0	
385.	40	.005	L2F0	
386.	40	.008	L2F0	
387.	35	.008	L2F0	
388.	45	.005	L2F0	
389.	35	.008	L2F0	
390.	40	.008	L2F0	

ASTM L-37 Axle Assembly

Dana P/N: 060AA100-2 Ring Gear/Pinion Heat Code: **P4L792/V1L417**
Assembly Date: Dec-05

	Torque-To-Rotate (in.lbs)	*Backlash (inches)*	*Contact Pattern - Drive Side*	**Rework** *(Check only, where app.)*
391.	25	.009	L2F0	
392.	40	.008	L2F0	
393.	40	.007	L2F0	
394.	35	.009	L2F0	
395.	20	.008	L2F0	
396.	25	.005	L2F0	
397.	40	.005	L2F0	
398.	35	.008	L2F0	
399.	45	.006	L2F0	
400.	45	.007	L2F0	
401.	25	.009	L2F0	
402.	40	.006	L2F-1	
403.	35	.008	L2F0	
404.	40	.005	L2F0	
405.	25	.007	L2F0	
406.	25	.005	L2F0	
407.	40	.008	L2F0	
408.	30	.007	L2F0	
409.	30	.009	L2F0	
410.	40	.008	L2F0	
411.	25	.008	L2F0	
412.	35	.009	L2F0	
413.	25	.009	L2F0	
414.	35	.006	L2F0	
415.	40	.007	L2F0	
416.	40	.008	L2F0	
417.	40	.007	L2F0	
418.	25	.005	L2F0	
419.	30	.007	L2F0	
420.	30	.007	L2F0	

Attachment 1
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ASTM L-37 Axle Assembly

Dana P/N: 060AA100-2 Ring Gear/Pinion Heat Code: **P4L792/V1L417**
Assembly Date: Dec-05

	Torque-To-Rotate (in.lbs)	*Backlash (inches)*	*Contact Pattern - Drive Side*	**Rework** *(Check only, where app.)*
421.	35	.006	L2F0	
422.	35	.008	L2F0	
423.	30	.009	L2F0	
424.	20	.008	L2F0	
425.	35	.006	L2F0	
426.	30	.007	L2F0	
427.	25	.005	L2F0	
428.	25	.005	L2F0	
429.	40	.008	L2F-1	
430.	25	.005	L2F0	
431.	40	.007	L2F0	
432.	40	.006	L2F+1	
433.	30	.007	L2F0	
434.	25	.007	L2F+1	
435.	40	.005	L2F+1	
436.	20	.007	L2F0	
437.	25	.005	L2F0	
438.	30	.006	L2F0	
439.	35	.007	L2F0	
440.	25	.006	L2F0	
441.	20	.006	L2F0	
442.	30	.006	L2F0	
443.	20	.005	L2F+1	
444.	45	.007	L2F0	
445.	30	.005	L2F0	
446.	40	.005	L2F0	
447.	40	.007	L2F0	
448.	30	.007	L2F0	
449.	20	.009	L2F0	
450.	25	.008	L2F-1	

ASTM L-37 Axle Assembly

Dana P/N: 060AA100-2 Ring Gear/Pinion Heat Code: **P4L792/V1L417**
Assembly Date: Dec-05

	Torque-To-Rotate (in.lbs)	*Backlash (inches)*	*Contact Pattern - Drive Side*	**Rework** *(Check only, where app.)*
451.	30	.008	L2F0	
452.	35	.007	L2F0	
453.	35	.006	L2F0	
454.	35	.008	L2F0	
455.	30	.009	L2F0	
456.	35	.007	L2F+1	
457.	45	.006	L2F0	
458.	35	.007	L2F0	
459.	35	.007	L2F+1	
460.	40	.007	L2F0	
461.	40	.005	L2F0	
462.	35	.005	L2F+1	
463.	45	.005	L2F0	
464.	40	.007	L2F0	
465.	35	.009	L2F0	
466.	40	.008	L2F0	
467.	35	.007	L2F-1	
468.	25	.006	L2F0	
469.	30	.005	L2F0	
470.	30	.009	L2F0	
471.	40	.006	L2F0	
472.	25	.007	L2F0	
473.	25	.005	L2F0	
474.	20	.005	L2F0	
475.	35	.005	L2F0	
476.	45	.005	L2F0	
477.	30	.005	L2F0	
478.	35	.005	L2F0	
479.	45	.005	L2F+1	
480.	45	.005	L2F0	

ASTM L-37 Axle Assembly

Dana P/N: 060AA100-2 Ring Gear/Pinion Heat Code: **P4L792/V1L417**
Assembly Date: Dec-05

	Torque-To-Rotate (in.lbs)	*Backlash (inches)*	*Contact Pattern - Drive Side*	**Rework** *(Check only, where app.)*
481.	25	.007	L2F0	
482.	30	.009	L2F0	
483.	20	.008	L2F0	
484.	30	.009	L2F-1	
485.	25	.007	L2F0	
486.	40	.009	L2F0	
487.	35	.005	L2F0	
488.	35	.007	L2F0	
489.	20	.007	L2F0	
490.	35	.008	L2F0	
491.	45	.007	L2F0	
492.	25	.008	L2F0	
493.	30	.008	L2F0	
494.	45	.008	L2F0	
495.	30	.009	L2F0	
496.	30	.007	L2F0	
497.	25	.008	L2F-1	
498.	25	.008	L2F0	
499.	45	.007	L2F0	
500.	30	.007	L2F0	
501.	40	.006	L2F0	
502.	25	.007	L2F0	
503.	35	.007	L2F0	
504.	25	.008	L2F0	
505.	35	.006	L2F0	
506.	30	.007	L2F0	
507.	25	.009	L2F0	
508.	25	.008	L2F0	
509.	30	.009	L2F0	
510.	30	.009	L2F0	

ASTM L-37 Axle Assembly

Dana P/N: 060AA100-2 Ring Gear/Pinion Heat Code: **P4L792/V1L417**
Assembly Date: Dec-05

	Torque-To-Rotate (in.lbs)	*Backlash (inches)*	*Contact Pattern - Drive Side*	**Rework** *(Check only, where app.)*
511.	35	.007	L2F0	
512.	25	.009	L2F0	
513.	40	.007	L2F-1	
514.	25	.009	L2F0	
515.	40	.005	L2F0	
516.	35	.005	L2F0	
517.	40	.005	L2F0	
518.	45	.005	L2F0	
519.	30	.009	L2F0	
520.	40	.006	L2F0	
521.	35	.005	L2F0	
522.	40	.005	L2F0	
523.	35	.006	L2F0	
524.	40	.005	L2F0	
525.	30	.006	L2F0	
526.	35	.008	L2F0	
527.	25	.005	L2F0	
528.	40	.006	L2F0	
529.	35	.005	L2F0	
530.	20	.006	L2F0	
531.	25	.005	L2F0	
532.	30	.006	L2F-1	
533.	30	.005	L2F-1	
534.	35	.007	L2F0	
535.	40	.005	L2F0	
536.	40	.005	L2F0	
537.	40	.005	L2F0	
538.	25	.005	L2F0	
539.	30	.006	L2F0	
540.	40	.007	L2F0	

ASTM L-37 Axle Assembly

Dana P/N: 060AA100-2 Ring Gear/Pinion Heat Code: **P4L792/V1L417**
Assembly Date: Dec-05

	Torque-To-Rotate (in.lbs)	*Backlash (inches)*	*Contact Pattern - Drive Side*	**Rework** *(Check only, where app.)*
541.	45	.008	L2F0	
542.	25	.005	L2F0	
543.	45	.006	L2F0	
544.	30	.007	L2F0	
545.	30	.008	L2F0	
546.	25	.009	L2F0	
547.	35	.007	L2F0	
548.	30	.007	L2F0	
549.	20	.005	L2F0	
550.	35	.006	L2F0	
551.	20	.008	L2F0	
552.	30	.007	L2F-1	
553.	30	.008	L2F0	
554.	35	.008	L2F0	
555.	40	.008	L2F0	
556.	35	.007	L2F0	
557.	30	.006	L2F-1	
558.	35	.009	L2F0	
559.	25	.007	L2F0	
560.	35	.005	L2F-1	
561.	30	.005	L2F0	
562.	40	.006	L2F0	
563.	35	.007	L2F0	
564.	35	.007	L2F0	
565.	30	.009	L2F0	
566.	30	.007	L2F0	
567.	35	.007	L2F0	
568.	25	.006	L2F0	
569.	25	.007	L2F0	
570.	35	.008	L2F0	

Attachment 4
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Reference L-37F

ASTM L-37 Axle Assembly

Dana P/N: 060AA100-2 Ring Gear/Pinion Heat Code: **P4L792/V1L417**
Assembly Date: Dec-05

	Torque-To-Rotate (in.lbs)	*Backlash (inches)*	*Contact Pattern - Drive Side*	**Rework** *(Check only, where app.)*
571.	40	.007	L2F0	
572.	30	.006	L2F0	
573.	35	.006	L2F0	
574.	45	.005	L2F0	
575.	25	.008	L2F0	
576.	35	.009	L2F0	
577.	40	.007	L2F0	
578.	25	.006	L2F0	
579.	40	.005	L2F0	
580.	25	.008	L2F0	
581.	35	.006	L2F0	
582.	25	.008	L2F0	
583.	25	.007	L2F-1	
584.	25	.008	L2F0	
585.	25	.007	L2F0	
586.	30	.005	L2F0	
587.	20	.008	L2F0	
588.	35	.008	L2F0	
589.	20	.008	L2F0	
590.	25	.009	L2F0	
591.	30	.007	L2F-1	
592.	30	.009	L2F0	
593.	30	.009	L2F0	
594.	20	.009	L2F0	
595.	35	.009	L2F0	
596.	20	.009	L2F0	
597.	35	.007	L2F0	
598.	40	.009	L2F0	
599.	20	.008	L2F0	
600.	35	.008	L2F0	

Attachment 4
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ASTM L-37 Axle Assembly

Dana P/N: 060AA100-2 Ring Gear/Pinion Heat Code: **P4L792/V1L417**
Assembly Date: Dec-05

	Torque-To-Rotate (in.lbs)	*Backlash (inches)*	*Contact Pattern - Drive Side*	**Rework** *(Check only, where app.)*
601.	25	.009	L2F0	
602.	35	.008	L2F0	
603.	30	.007	L2F0	
604.	40	.009	L2F0	
605.	40	.005	L2F0	
606.	25	.006	L2F0	
607.	25	.005	L2F0	
608.	30	.007	L2F0	
609.	25	.007	L2F0	
610.	25	.007	L2F0	
611.	30	.008	L2F0	
612.	20	.005	L2F0	
613.	25	.009	L2F0	
614.	35	.007	L2F0	
615.	25	.007	L2F+1	
616.	25	.006	L2F+1	
617.	25	.007	L2F0	
618.	25	.006	L2F0	
619.	40	.008	L2F0	
620.	20	.007	L2F0	
621.	20	.007	L2F0	
622.	25	.007	L2F+1	
623.	25	.008	L2F0	
624.	30	.005	L2F0	
625.	25	.007	L2F0	
626.	25	.008	L2F0	
627.	20	.009	L2F-1	
628.	20	.009	L2F0	
629.	20	.005	L2F+1	
630.	35	.005	L2F0	

ASTM L-37 Axle Assembly

Dana P/N: 060AA100-2 Ring Gear/Pinion Heat Code: **P4L792/V1L417**
Assembly Date: Dec-05

	Torque-To-Rotate (in.lbs)	*Backlash (inches)*	*Contact Pattern - Drive Side*	**Rework** *(Check only, where app.)*
631.	35	.007	L2F0	
632.	35	.007	L2F0	
633.	40	.005	L2F+1	
634.	25	.009	L2F0	
635.	30	.008	L2F0	
636.	45	.008	L2F0	
637.	35	.005	L2F0	
638.	35	.008	L2F0	
639.	35	.009	L2F0	
640.	20	.008	L2F0	
641.	40	.005	L2F0	
642.	30	.005	L2F0	
643.	20	.007	L2F0	
644.	20	.009	L2F0	
645.	25	.006	L2F0	
646.	35	.008	L2F0	
647.	30	.009	L2F0	
648.	30	.008	L2F-1	
649.	40	.007	L2F0	
650.	45	.009	L2F0	
651.	45	.005	L2F0	
652.	40	.009	L2F0	
653.	40	.009	L2F0	
654.	45	.008	L2F0	
655.	25	.007	L2F0	
656.	35	.008	L2F0	
657.	30	.009	L2F0	
658.	35	.005	L2F0	
659.	35	.005	L2F0	
660.	40	.007	L2F-1	

ASTM L-37 Axle Assembly

Dana P/N: 060AA100-2 Ring Gear/Pinion Heat Code: **P4L792/V1L417**
Assembly Date: Dec-05

	Torque-To-Rotate (in.lbs)	*Backlash (inches)*	*Contact Pattern - Drive Side*	**Rework** *(Check only, where app.)*
661.	30	.008	L2F-1	
662.	40	.008	L2F0	
663.	40	.008	L2F0	
664.	35	.009	L2F0	
665.	35	.008	L2F0	
666.	35	.006	L2F0	
667.	25	.005	L2F0	
668.	45	.006	L2F0	
669.	30	.008	L2F-1	
670.	40	.008	L2F0	
671.	25	.009	L2F-1	
672.	40	.009	L2F0	
673.	35	.007	L2F0	
674.	30	.009	L2F0	
675.	45	.007	L2F0	
676.	35	.008	L2F0	
677.	30	.008	L2F0	
678.	35	.006	L2F0	
679.	25	.005	L2F0	
680.	40	.005	L2F0	
681.	35	.005	L2F0	
682.	25	.008	L2F0	
683.	35	.008	L2F0	
684.	25	.009	L2F-1	
685.	40	.009	L2F0	
686.	45	.009	L2F0	
687.	45	.005	L2F0	
688.	30	.006	L2F0	
689.	40	.007	L2F-1	
690.	30	.005	L2F0	

ASTM L-37 Axle Assembly

Dana P/N: 060AA100-2 Ring Gear/Pinion Heat Code: **P4L792/V1L417**
Assembly Date: Dec-05

	Torque-To-Rotate (in.lbs)	*Backlash (inches)*	*Contact Pattern - Drive Side*	**Rework** *(Check only, where app.)*
691.	40	.006	L2F0	
692.	45	.007	L2F0	
693.	30	.009	L2F0	
694.	35	.007	L2F0	
695.	40	.008	L2F0	
696.	40	.009	L2F-1	
697.	25	.007	L2F0	
698.	40	.006	L2F0	
699.	30	.006	L2F0	
700.	40	.007	L2F-1	
701.	30	.009	L2F-1	
702.	20	.007	L2F0	
703.	40	.008	L2F0	
704.	40	.009	L2F0	
705.	35	.009	L2F0	
706.	40	.006	L2F0	
707.	45	.006	L2F0	
708.	25	.007	L2F0	
709.	35	.006	L2F0	
710.	20	.007	L2F0	
711.	20	.005	L2F0	
712.	40	.008	L2F0	
713.	20	.007	L2F0	
714.	25	.009	L2F0	
715.	25	.008	L2F0	
716.	35	.007	L2F0	
717.	25	.006	L2F0	
718.	45	.009	L2F0	
719.	25	.006	L2F0	
720.	35	.005	L2F0	

ASTM L-37 Axle Assembly

Dana P/N: 060AA100-2 Ring Gear/Pinion Heat Code: **P4L792/V1L417**
Assembly Date: Dec-05

	Torque-To-Rotate (in.lbs)	*Backlash (inches)*	*Contact Pattern - Drive Side*	**Rework** *(Check only, where app.)*
721.	20	.007	L2F0	
722.	25	.005	L2F-1	
723.	30	.009	L2F0	
724.	45	.007	L2F0	
725.	25	.009	L2F0	
726.	25	.006	L2F0	
727.	20	.006	L2F0	
728.	25	.005	L2F0	
729.	35	.007	L2F0	
730.	25	.006	L2F-1	
731.	25	.006	L2F0	
732.	40	.009	L2F0	
733.	20	.007	L2F0	
734.	30	.009	L2F0	
735.	20	.009	L2F0	
736.	20	.006	L2F0	
737.	30	.005	L2F0	
738.	45	.005	L2F0	
739.	20	.007	L2F0	
740.	35	.009	L2F0	
741.	40	.007	L2F0	
742.	25	.005	L2F0	
743.	25	.006	L2F0	
744.	30	.005	L2F0	
745.	30	.008	L2F0	
746.	25	.007	L2F0	
747.	20	.005	L2F+1	
748.	25	.008	L2F0	
749.	20	.005	L2F0	
750.	30	.007	L2F-1	

ASTM L-37 Axle Assembly

Dana P/N: 060AA100-2 Ring Gear/Pinion Heat Code: **P4L792/V1L417**
Assembly Date: Dec-05

	Torque-To-Rotate (in.lbs)	*Backlash (inches)*	*Contact Pattern - Drive Side*	**Rework** *(Check only, where app.)*
751.	25	.009	L2F-1	
752.	35	.006	L2F0	
753.	35	.006	L2F0	
754.	25	.005	L2F0	
755.	25	.008	L2F0	
756.	30	.009	L2F0	
757.	35	.006	L2F0	
758.	30	.007	L2F0	
759.	35	.007	L2F0	
760.	25	.006	L2F0	
761.	20	.007	L2F0	
762.	35	.009	L2F0	
763.	45	.005	L2F0	
764.	30	.006	L2F0	
765.	30	.006	L2F0	
766.	35	.007	L2F0	
767.	35	.008	L2F0	
768.	30	.007	L2F0	
769.	40	.009	L2F0	
770.	30	.009	L2F0	
771.	20	.005	L2F0	
772.	35	.008	L2F-1	
773.	25	.006	L2F0	
774.	20	.009	L2F+1	
775.	35	.008	L2F0	
776.	35	.007	L2F0	
777.	35	.007	L2F0	
778.	25	.009	L2F0	
779.	35	.008	L2F0	
780.	35	.009	L2F0	

ASTM L-37 Axle Assembly

Dana P/N: 060AA100-2 Ring Gear/Pinion Heat Code: **P4L792/V1L417**
Assembly Date: Dec-05

	Torque-To-Rotate (in.lbs)	*Backlash (inches)*	*Contact Pattern - Drive Side*	**Rework** *(Check only, where app.)*
781.	40	.005	L2F0	
782.	25	.007	L2F0	
783.	45	.008	L2F0	
784.	20	.007	L2F0	
785.	25	.009	L2F0	
786.	30	.008	L2F0	
787.	20	.009	L2F0	
788.	30	.008	L2F0	
789.	40	.009	L2F0	
790.	35	.005	L2F0	
791.	35	.007	L2F0	
792.	40	.005	L2F0	
793.	40	.009	L2F0	
794.	25	.008	L2F0	
795.	30	.009	L2F0	
796.	45	.009	L2F0	
797.	45	.005	L2F0	
798.	45	.006	L2F0	
799.	30	.009	L2F+1	
800.	30	.009	L2F0	
801.	30	.005	L2F0	
802.	35	.009	L2F0	
803.	40	.009	L2F+1	
804.	25	.007	L2F0	
805.	25	.007	L2F0	
806.	20	.008	L2F0	
807.	20	.005	L2F0	
808.	20	.007	L2F0	
809.	40	.005	L2F0	
810.	40	.006	L2F0	

ASTM L-37 Axle Assembly

Dana P/N: 060AA100-2 Ring Gear/Pinion Heat Code: **P4L792/V1L417**
Assembly Date: Dec-05

	Torque-To-Rotate (in.lbs)	*Backlash (inches)*	*Contact Pattern - Drive Side*	**Rework** *(Check only, where app.)*
811.	35	.009	L2F+1	
812.	40	.005	L2F0	
813.	25	.008	L2F0	
814.	25	.009	L2F0	
815.	35	.008	L2F-1	
816.	25	.009	L2F0	
817.	40	.005	L2F0	
818.	30	.005	L2F0	
819.	40	.007	L2F0	
820.	35	.008	L2F-1	
821.	40	.007	L2F0	
822.	40	.009	L2F0	
823.	25	.008	L2F0	
824.	20	.007	L2F0	
825.	20	.006	L2F0	
826.	35	.005	L2F0	
827.	35	.007	L2F0	
828.	25	.007	L2F0	
829.	30	.005	L2F0	
830.	40	.005	L2F0	
831.	35	.005	L2F0	
832.	35	.006	L2F+1	
833.	40	.005	L2F0	
834.	30	.009	L2F0	
835.	25	.007	L2F-1	
836.	20	.009	L2F0	
837.	20	.005	L2F0	
838.	30	.008	L2F0	
839.	30	.005	L2F0	
840.	40	.005	L2F0	

ASTM L-37 Axle Assembly

Dana P/N: 060AA100-2 Ring Gear/Pinion Heat Code: **P4L792/V1L417**
Assembly Date: Dec-05

	Torque-To-Rotate (in.lbs)	*Backlash (inches)*	*Contact Pattern - Drive Side*	**Rework** *(Check only, where app.)*
841.	20	.005	L2F0	
842.	35	.009	L2F0	
843.	35	.006	L2F0	
844.	20	.005	L2F0	
845.	35	.009	L2F0	
846.	45	.009	L2F0	
847.	40	.007	L2F0	
848.	20	.005	L2F0	
849.	40	.005	L2F0	
850.	20	.006	L2F0	
851.	30	.009	L2F0	
852.	40	.009	L2F0	
853.	40	.008	L2F0	
854.	25	.006	L2F0	
855.	35	.009	L2F0	
856.	20	.007	L2F0	
857.	35	.007	L2F0	
858.	25	.009	L2F0	
859.	45	.005	L2F0	
860.	35	.008	L2F0	
861.	25	.005	L2F0	
862.	20	.006	L2F0	
863.	45	.005	L2F+1	
864.	35	.007	L2F0	
865.	30	.005	L2F0	
866.	20	.007	L2F0	
867.	40	.007	L2F0	
868.	20	.005	L2F+1	
869.	25	.008	L2F0	
870.	30	.005	L2F0	

ASTM L-37 Axle Assembly

Dana P/N: 060AA100-2 Ring Gear/Pinion Heat Code: **~~P4L792/V1L417~~**
Assembly Date: Dec-05

	Torque-To-Rotate (in.lbs)	*Backlash (inches)*	*Contact Pattern - Drive Side*	**Rework** *(Check only, where app.)*
871.	35	.007	L2F0	
872.	45	.007	L2F0	
873.	40	.006	L2F0	
874.	25	.007	L2F0	
875.	25	.005	L2F0	
876.	35	.006	L2F0	
877.	20	.006	L2F0	
878.	40	.009	L2F+1	
879.	35	.008	L2F0	
880.	40	.009	L2F0	
881.	25	.008	L2F0	
882.	25	.007	L2F0	
883.	45	.009	L2F0	
884.	30	.008	L2F0	
885.	40	.007	L2F0	
886.	25	.008	L2F0	
887.	30	.009	L2F0	
888.	30	.009	L2F0	
889.	45	.007	L2F0	
890.	35	.006	L2F0	
891.	35	.009	L2F0	
892.	45	.005	L2F0	
893.	25	.007	L2F0	
894.	45	.008	L2F0	
895.	20	.006	L2F0	
896.	25	.007	L2F0	
897.	40	.009	L2F0	
898.	40	.009	L2F0	
899.	35	.007	L2F0	
900.	45	.008	L2F0	

ASTM L-37 Axle Assembly

Dana P/N: 060AA100-2 Ring Gear/Pinion Heat Code: **P4L792/V1L417**
Assembly Date: Dec-05

	Torque-To-Rotate (in.lbs)	*Backlash (inches)*	*Contact Pattern - Drive Side*	**Rework** *(Check only, where app.)*
901.	40	.005	L2F0	
902.	40	.008	L2F0	
903.	25	.007	L2F0	
904.	35	.009	L2F0	
905.	35	.008	L2F0	
906.	40	.009	L2F0	
907.	45	.008	L2F0	
908.	25	.006	L2F0	
909.	45	.008	L2F0	
910.	25	.005	L2F0	
911.	20	.006	L2F0	
912.	30	.005	L2F0	
913.	20	.005	L2F0	
914.	40	.007	L2F0	
915.	40	.009	L2F0	
916.	40	.009	L2F0	
917.	25	.006	L2F0	
918.	35	.008	L2F0	
919.	40	.005	L2F0	
920.	45	.008	L2F0	
921.	40	.009	L2F0	
922.	25	.009	L2F0	
923.	35	.006	L2F0	
924.	30	.008	L2F0	
925.	25	.007	L2F0	
926.	25	.006	L2F0	
927.	20	.007	L2F0	
928.	40	.007	L2F0	
929.	45	.007	L2F0	
930.	35	.008	L2F0	

ASTM L-37 Axle Assembly

Dana P/N: 060AA100-2 Ring Gear/Pinion Heat Code: **P4L792/V1L417**
Assembly Date: Dec-05

	Torque-To-Rotate (in.lbs)	*Backlash (inches)*	*Contact Pattern - Drive Side*	**Rework** *(Check only, where app.)*
931.	25	.005	L2F0	
932.	30	.009	L2F+1	
933.	35	.008	L2F0	
934.	35	.009	L2F0	
935.	20	.006	L2F0	
936.	40	.005	L2F0	
937.	40	.009	L2F0	
938.	30	.007	L2F0	
939.	20	.006	L2F0	
940.	20	.007	L2F0	
941.	45	.009	L2F0	
942.	30	.008	L2F0	
943.	25	.008	L2F0	
944.	25	.008	L2F0	
945.	25	.007	L2F0	
946.	35	.007	L2F0	
947.	20	.005	L2F+1	
948.	20	.005	L2F0	
949.	45	.005	L2F0	
950.	25	.009	L2F0	
951.	35	.006	L2F0	
952.	40	.005	L2F0	
953.	35	.009	L2F0	
954.	45	.009	L2F0	
955.	40	.009	L2F0	
956.	25	.005	L2F0	
957.	35	.009	L2F0	
958.	25	.006	L2F0	
959.	30	.005	L2F0	
960.	40	.007	L2F-1	

ASTM L-37 Axle Assembly

Dana P/N: 060AA100-2 Ring Gear/Pinion Heat Code: **P4L792/V1L417**
Assembly Date: Dec-05

	Torque-To-Rotate (in.lbs)	*Backlash (inches)*	*Contact Pattern - Drive Side*	**Rework** *(Check only, where app.)*
961.	35	.008	L2F0	
962.	35	.008	L2F0	
963.	40	.005	L2F0	
964.	35	.009	L2F0	
965.	25	.006	L2F0	
966.	40	.009	L2F0	
967.	40	.005	L2F0	
968.	30	.005	L2F0	
969.	40	.007	L2F0	
970.	45	.008	L2F0	
971.	20	.006	L2F0	
972.	25	.005	L2F0	
973.	30	.006	L2F0	
974.	25	.007	L2F0	
975.	35	.007	L2F0	
976.	20	.006	L2F0	
977.	35	.006	L2F0	
978.	25	.008	L2F0	
979.	40	.007	L2F+1	
980.	35	.009	L2F0	
981.	40	.007	L2F0	
982.	35	.007	L2F0	
983.	40	.006	L2F0	
984.	40	.008	L2F0	
985.	40	.007	L2F0	
986.	40	.007	L2F0	
987.	30	.007	L2F0	
988.	45	.009	L2F0	
989.	25	.009	L2F0	
990.	45	.005	L2F0	

ASTM L-37 Axle Assembly

Dana P/N: 060AA100-2 Ring Gear/Pinion Heat Code: **P4L792/V1L417**
Assembly Date: Dec-05

	Torque-To-Rotate (in.lbs)	*Backlash (inches)*	*Contact Pattern - Drive Side*	**Rework** *(Check only, where app.)*
991.	25	.009	L2F0	
992.	40	.009	L2F0	
993.	40	.006	L2F+1	
994.	25	.009	L2F0	
995.	40	.009	L2F0	
996.	35	.009	L2F0	
997.	45	.009	L2F0	
998.	40	.005	L2F0	
999.	25	.005	L2F0	
1000.	45	.006	L2F-1	
1001.	25	.006	L2F0	
1002.	45	.005	L2F0	
1003.	25	.008	L2F0	
1004.	40	.008	L2F0	
1005.	40	.005	L2F0	
1006.	40	.005	L2F0	
1007.	25	.005	L2F0	
1008.	30	.008	L2F0	
1009.	35	.005	L2F0	
1010.	35	.008	L2F0	
1011.	35	.007	L2F0	
1012.	30	.005	L2F0	
1013.	30	.005	L2F0	
1014.	25	.005	L2F-1	
1015.	40	.006	L2F0	
1016.	45	.006	L2F0	
1017.	25	.006	L2F0	
1018.	20	.005	L2F0	
1019.	35	.005	L2F0	
1020.	30	.005	L2F0	

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ASTM L-37 Axle Assembly

Dana P/N: 060AA100-2 Ring Gear/Pinion Heat Code: **P4L792/V1L417**
Assembly Date: Dec-05

	Torque-To-Rotate (in.lbs)	*Backlash (inches)*	*Contact Pattern - Drive Side*	**Rework** *(Check only, where app.)*
1021.	35	.009	L2F0	
1022.	35	.005	L2F0	
1023.	40	.009	L2F0	
1024.	35	.009	L2F0	
1025.	25	.007	L2F0	
1026.	45	.005	L2F0	
1027.	30	.009	L2F0	
1028.	35	.006	L2F0	
1029.	35	.009	L2F0	
1030.	30	.005	L2F0	
1031.	35	.005	L2F0	
1032.	45	.009	L2F0	
1033.	35	.005	L2F0	
1034.	25	.009	L2F0	
1035.	20	.005	L2F0	
1036.	45	.006	L2F0	
1037.	35	.005	L2F0	
1038.	35	.009	L2F0	
1039.	35	.009	L2F0	
1040.	40	.009	L2F0	
1041.	35	.009	L2F0	
1042.	30	.005	L2F0	
1043.	45	.006	L2F0	
1044.	20	.008	L2F0	
1045.	35	.006	L2F0	
1046.	35	.009	L2F0	
1047.	35	.006	L2F0	
1048.	40	.009	L2F0	
1049.	35	.009	L2F0	
1050.	25	.007	L2F0	

Attachment 4
Page 34
Reference L-37F

ASTM L-37 Axle Assembly

Dana P/N: 060AA100-2 Ring Gear/Pinion Heat Code: **P4L792/V1L417**
Assembly Date: Dec-05

	Torque-To-Rotate (in.lbs)	*Backlash (inches)*	*Contact Pattern - Drive Side*	**Rework** *(Check only, where app.)*
1051.	30	.009	L2F0	
1052.	35	.008	L2F0	
1053.	20	.007	L2F0	
1054.	25	.006	L2F0	
1055.	40	.008	L2F0	
1056.	40	.009	L2F0	
1057.	25	.006	L2F0	
1058.	25	.007	L2F0	
1059.	30	.007	L2F0	
1060.	35	.005	L2F0	
1061.	40	.009	L2F0	
1062.	30	.005	L2F0	
1063.	45	.009	L2F0	
1064.	30	.009	L2F0	
1065.	25	.009	L2F0	
1066.	40	.009	L2F0	
1067.	35	.005	L2F0	
1068.	35	.009	L2F0	
1069.	35	.005	L2F0	
1070.	40	.009	L2F0	
1071.	35	.005	L2F0	
1072.	35	.009	L2F0	
1073.	40	.009	L2F0	
1074.	20	.007	L2F0	
1075.	25	.007	L2F0	
1076.	30	.008	L2F0	
1077.	35	.007	L2F0	
1078.	40	.008	L2F0	
1079.	35	.009	L2F0	
1080.	35	.007	L2F0	

ASTM L-37 Axle Assembly

Dana P/N: 060AA100-2 Ring Gear/Pinion Heat Code: **P4L792/V1L417**
Assembly Date: Dec-05

	Torque-To-Rotate (in.lbs)	*Backlash (inches)*	*Contact Pattern - Drive Side*	**Rework** *(Check only, where app.)*
1081.	35	.007	L2F0	
1082.	25	.005	L2F0	
1083.	25	.009	L2F0	
1084.	35	.006	L2F0	
1085.	35	.009	L2F0	
1086.	35	.005	L2F0	
1087.	35	.007	L2F0	
1088.	25	.009	L2F0	
1089.	40	.008	L2F-1	
1090.	35	.005	L2F0	
1091.	35	.007	L2F0	
1092.	25	.009	L2F0	
1093.	40	.008	L2F-1	
1094.	20	.005	L2F0	
1095.	25	.009	L2F0	
1096.	30	.009	L2F0	
1097.	45	.008	L2F0	
1098.	45	.008	L2F0	
1099.	35	.006	L2F0	
1100.	25	.009	L2F-1	
1101.	20	.007	L2F0	
1102.	40	.009	L2F0	
1103.	40	.006	L2F0	
1104.	45	.009	L2F0	
1105.	35	.007	L2F0	
1106.	30	.009	L2F+1	
1107.	20	.007	L2F0	
1108.	25	.009	L2F0	
1109.	35	.009	L2F0	
1110.	20	.009	L2F0	

Attachment 4
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Reference L-37E

ASTM L-37 Axle Assembly

Dana P/N: 060AA100-2 Ring Gear/Pinion Heat Code: **P4L792/V1L417**
Assembly Date: Dec-05

	Torque-To-Rotate (in.lbs)	*Backlash (inches)*	*Contact Pattern - Drive Side*	**Rework** *(Check only, where app.)*
1111.	45	.008	L2F0	
1112.	30	.009	L2F0	
1113.	40	.006	L2F0	
1114.	25	.009	L2F0	
1115.	25	.005	L2F0	
1116.	25	.007	L2F0	
1117.	35	.009	L2F0	
1118.	40	.008	L2F0	
1119.	30	.006	L2F0	
1120.	40	.006	L2F-1	
1121.	25	.009	L2F0	
1122.	25	.007	L2F0	
1123.	35	.009	L2F0	
1124.	25	.007	L2F0	
1125.	25	.006	L2F0	
1126.	35	.009	L2F0	
1127.	30	.008	L2F0	
1128.	40	.006	L2F0	
1129.	40	.009	L2F0	
1130.	20	.009	L2F0	
1131.	45	.009	L2F0	
1132.	20	.008	L2F0	
1133.	35	.005	L2F0	
1134.	40	.006	L2F0	
1135.	25	.005	L2F0	
1136.	35	.008	L2F0	
1137.	45	.008	L2F0	
1138.	25	.008	L2F0	
1139.	30	.006	L2F0	
1140.	30	.008	L2F0	

ASTM L-37 Axle Assembly

Dana P/N: 060AA100-2 Ring Gear/Pinion Heat Code: **P4L792/V1L417**
Assembly Date: Dec-05

	Torque-To-Rotate (in.lbs)	*Backlash (inches)*	*Contact Pattern - Drive Side*	**Rework** *(Check only, where app.)*
1141.	40	.008	L2F0	
1142.	20	.007	L2F0	
1143.	30	.008	L2F0	
1144.	40	.008	L2F0	
1145.	35	.009	L2F0	
1146.	30	.005	L2F0	
1147.	35	.006	L2F0	
1148.	20	.005	L2F0	
1149.	20	.007	L2F0	
1150.	35	.009	L2F0	
1151.	40	.006	L2F0	
1152.	35	.007	L2F0	
1153.	40	.006	L2F0	
1154.	40	.008	L2F0	
1155.	25	.009	L2F0	
1156.	25	.006	L2F0	
1157.	20	.009	L2F0	
1158.	25	.008	L2F0	
1159.	30	.005	L2F0	
1160.	35	.007	L2F0	
1161.	25	.005	L2F0	
1162.	35	.005	L2F0	
1163.	40	.009	L2F0	
1164.	35	.005	L2F0	
1165.	35	.007	L2F0	
1166.	40	.009	L2F0	
1167.	45	.009	L2F0	
1168.	35	.006	L2F0	
1169.	40	.008	L2F0	
1170.	25	.009	L2F0	

ASTM L-37 Axle Assembly

Dana P/N: 060AA100-2 Ring Gear/Pinion Heat Code: **P4L792/V1L417**
Assembly Date: Dec-05

	Torque-To-Rotate (in.lbs)	*Backlash (inches)*	*Contact Pattern - Drive Side*	**Rework** *(Check only, where app.)*
1171.	20	.005	L2F0	
1172.	25	.008	L2F0	
1173.	25	.006	L2F0	
1174.	25	.007	L2F0	
1175.	45	.009	L2F0	
1176.	25	.007	L2F0	
1177.	30	.008	L2F0	
1178.	30	.009	L2F0	
1179.	30	.007	L2F0	
1180.	35	.006	L2F0	
1181.	30	.005	L2F0	
1182.	25	.005	L2F0	
1183.	35	.008	L2F0	
1184.	35	.006	L2F0	
1185.	40	.007	L2F0	
1186.	25	.006	L2F0	
1187.	35	.006	L2F0	
1188.	25	.009	L2F0	
1189.	30	.009	L2F0	
1190.	40	.005	L2F0	
1191.	20	.009	L2F0	
1192.	40	.009	L2F0	
1193.	30	.009	L2F0	
1194.	40	.009	L2F0	
1195.	35	.006	L2F0	
1196.	30	.006	L2F0	
1197.	45	.009	L2F0	
1198.	25	.008	L2F0	
1199.	40	.005	L2F0	
1200.	25	.009	L2F0	

ASTM L-37 Axle Assembly

Dana P/N: 060AA100-2 Ring Gear/Pinion Heat Code: **P4L792/V1L417**
Assembly Date: Dec-05

	Torque-To-Rotate (in.lbs)	*Backlash (inches)*	*Contact Pattern - Drive Side*	**Rework** *(Check only, where app.)*
1201.	40	.006	L2F0	
1202.	40	.005	L2F0	
1203.	35	.005	L2F0	
1204.	35	.006	L2F0	
1205.	30	.008	L2F0	
1206.	25	.008	L2F0	
1207.	40	.008	L2F0	
1208.	30	.008	L2F0	
1209.	40	.009	L2F0	
1210.	40	.009	L2F0	
1211.	40	.006	L2F0	
1212.	25	.005	L2F0	
1213.	45	.009	L2F0	
1214.	40	.006	L2F0	
1215.	40	.009	L2F0	
1216.	40	.009	L2F0	
1217.	25	.005	L2F0	
1218.	40	.006	L2F0	
1219.	35	.007	L2F0	
1220.	40	.008	L2F-1	
1221.	40	.006	L2F0	
1222.	45	.009	L2F0	
1223.	20	.009	L2F0	
1224.	35	.008	L2F0	
1225.	40	.007	L2F0	
1226.	40	.007	L2F0	
1227.	40	.008	L2F0	
1228.	35	.008	L2F0	
1229.	35	.006	L2F0	
1230.	25	.009	L2F0	

ASTM L-37 Axle Assembly

Dana P/N: 060AA100-2 Ring Gear/Pinion Heat Code: **P4L792/V1L417**
Assembly Date: Dec-05

	Torque-To-Rotate (in.lbs)	*Backlash (inches)*	*Contact Pattern - Drive Side*	**Rework** *(Check only, where app.)*
1231.	40	.009	L2F0	
1232.	25	.007	L2F0	
1233.	20	.008	L2F0	
1234.	45	.008	L2F0	
1235.	35	.009	L2F0	
1236.	45	.008	L2F0	
1237.	30	.009	L2F0	
1238.	20	.006	L2F0	
1239.	20	.009	L2F0	
1240.	35	.009	L2F0	
1241.	40	.006	L2F0	
1242.	30	.005	L2F0	
1243.	35	.009	L2F0	
1244.	40	.009	L2F0	
1245.	35	.009	L2F0	
1246.	40	.009	L2F0	
1247.	30	.005	L2F0	
1248.	30	.005	L2F0	
1249.	30	.005	L2F0	
1250.	20	.005	L2F0	
1251.	35	.006	L2F0	
1252.	35	.007	L2F0	
1253.	25	.005	L2F0	
1254.	35	.005	L2F0	
1255.	45	.005	L2F0	
1256.	20	.005	L2F0	
1257.	25	.005	L2F0	
1258.	40	.005	L2F0	
1259.	40	.005	L2F0	
1260.	40	.006	L2F0	

Attachment 4
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Reference L-37F

ASTM L-37 Axle Assembly

Dana P/N: 060AA100-2 Ring Gear/Pinion Heat Code: **P4L792/V1L417**
Assembly Date: Dec-05

	Torque-To-Rotate (in.lbs)	*Backlash (inches)*	*Contact Pattern - Drive Side*	**Rework** *(Check only, where app.)*
1261.	35	.005	L2F0	
1262.	40	.007	L2F0	
1263.	40	.007	L2F0	
1264.	20	.005	L2F0	
1265.	25	.008	L2F0	
1266.	40	.006	L2F0	
1267.	40	.008	L2F0	
1268.	40	.005	L2F0	
1269.	20	.005	L2F0	
1270.	35	.005	L2F0	
1271.	30	.009	L2F0	
1272.	30	.008	L2F0	
1273.	30	.005	L2F0	
1274.	30	.006	L2F0	
1275.	25	.009	L2F0	
1276.	20	.005	L2F0	
1277.	45	.008	L2F0	
1278.	35	.009	L2F0	
1279.	35	.009	L2F0	
1280.	35	.008	L2F0	
1281.	35	.008	L2F0	
1282.	40	.008	L2F0	
1283.	40	.008	L2F0	
1284.	40	.009	L2F0	
1285.	25	.008	L2F0	
1286.	25	.007	L2F-1	
1287.	30	.005	L2F0	
1288.	35	.005	L2F0	
1289.	25	.009	L2F0	
1290.	40	.005	L2F0	

ASTM L-37 Axle Assembly

Dana P/N: 060AA100-2 Ring Gear/Pinion Heat Code: **P4L792/V1L417**
Assembly Date: Dec-05

	Torque-To-Rotate (in.lbs)	*Backlash (inches)*	*Contact Pattern - Drive Side*	**Rework** *(Check only, where app.)*
1291.	35	.006	L2F0	
1292.	35	.009	L2F0	
1293.	40	.008	L2F0	
1294.	45	.008	L2F0	
1295.	30	.006	L2F0	
1296.	20	.007	L2F0	
1297.	25	.009	L2F0	
1298.	25	.009	L2F0	
1299.	35	.005	L2F0	
1300.	40	.006	L2F0	
1301.	35	.009	L2F0	
1302.	40	.009	L2F0	
1303.	25	.005	L2F0	

Bartlett, Donald

From: Ken.Okamuro@dana.com
Sent: Tuesday, July 12, 2005 11:33 AM
To: Bartlett, Donald
Subject: Pinion greasing and torque to turn
Attachments: pinion grease.pdf; Chevron grease.pdf; grease2.pdf

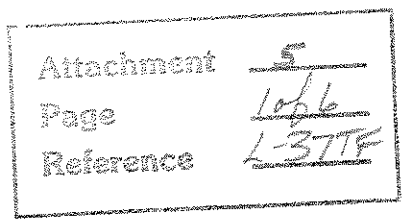
Don,

I have attached the assembly process sheets that apply to the pinion bearing assembly and the torque to turn measurement.

Although the assembly drawing does not call for greasing the front pinion bearing, those that I have interviewed said we have always done that here and it was also always done at Morganton. The assembly fixture to set the front bearing has grease injection holes and pump. The assembler actuates a hand pump to fill the bearing. You are likely to see variation in the amount of grease dispensed since it is a manual operation.

From the best information I have, the greased used (at least at Statesville) was Chevron Dura - Lith EP, NLGI 2. I have attached a page from the Chevron sales book for you to review. This is not the product I was hoping that they were using.
To prevent you from having to remove the grease, we could put a note on the drawing to omit the grease. This, however, makes it different from the other axles and more prone to error. Let me know what you want to do.

Ken

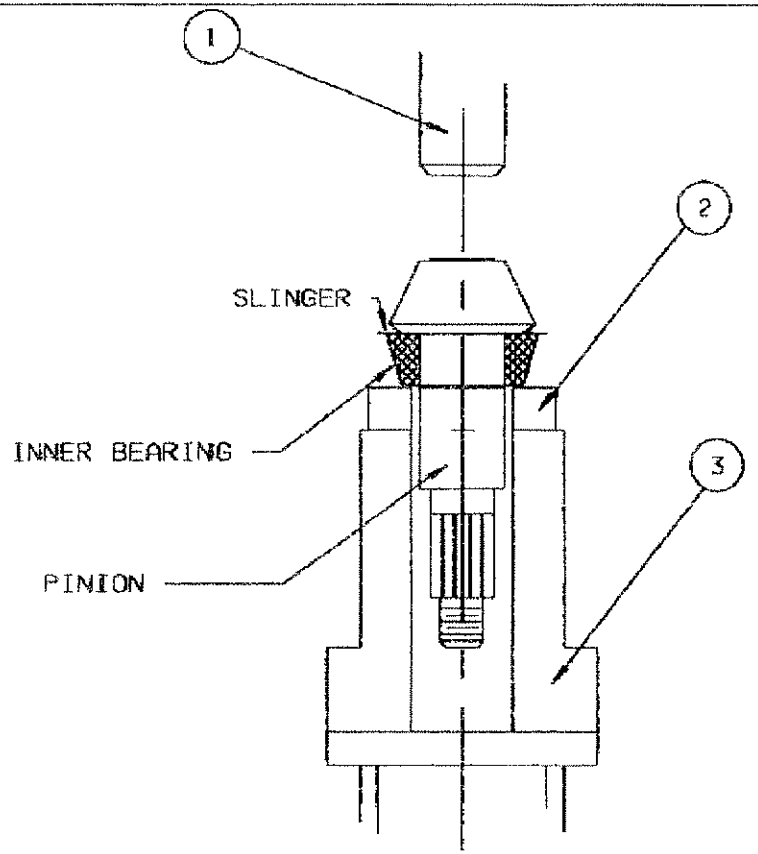


FORM #900-007.REV 12/15/96

PART NAME CARRIER ASSY	FILE: 950FL50-1	ENGINEERING SPEC.	DANA SPEC. NO.	NO.	LET	CHANGE	BY	DATE	ISSUE DATE 2-96	SHEET 1 OF 1
BASIC OPERATION PRESS LARGE BEARING ON PINION		GREASE			A	REVISED PS	SN	1/97	PART NO. ALL	MODEL NO. ALL
MACH TYPE LOGAN	MACH NO. 08-02-09	(PER PRINT SPEC)							DEPT NO. 950FL	OPER. NO. 50
										TOOL No. ST-485

OPERATION DESCRIPTION

ASSEMBLE SLINGER (IF REQ'D) WITH INNER BEARING CONE ONTO PINION -
PLACE THEM ON BEARING ADAPTOR (AS SHOWN)-
AND PRESS THEM TO SEAT BEARING - GREASE BEARING (IF REQ'D).
CHECK SET UP BOOK FOR GREASE



REF. NO.	NO. REQ'D	TOOL'S DESCRIPTION	MODEL & TOOL'S DETAIL No.				
			30	44	60	70	70HD
1	1	RAM EXTENSION					
2	1	BEARING ADAPTOR	15	15	14	13	13
3	1	BODY	2	2	7	7	7

100% VISUAL INSPECTION FOR COMPLETE PRESS UP

SPECIAL NOTES: REFER TO THE PRINT AND FOLLOW THIS PROCESS

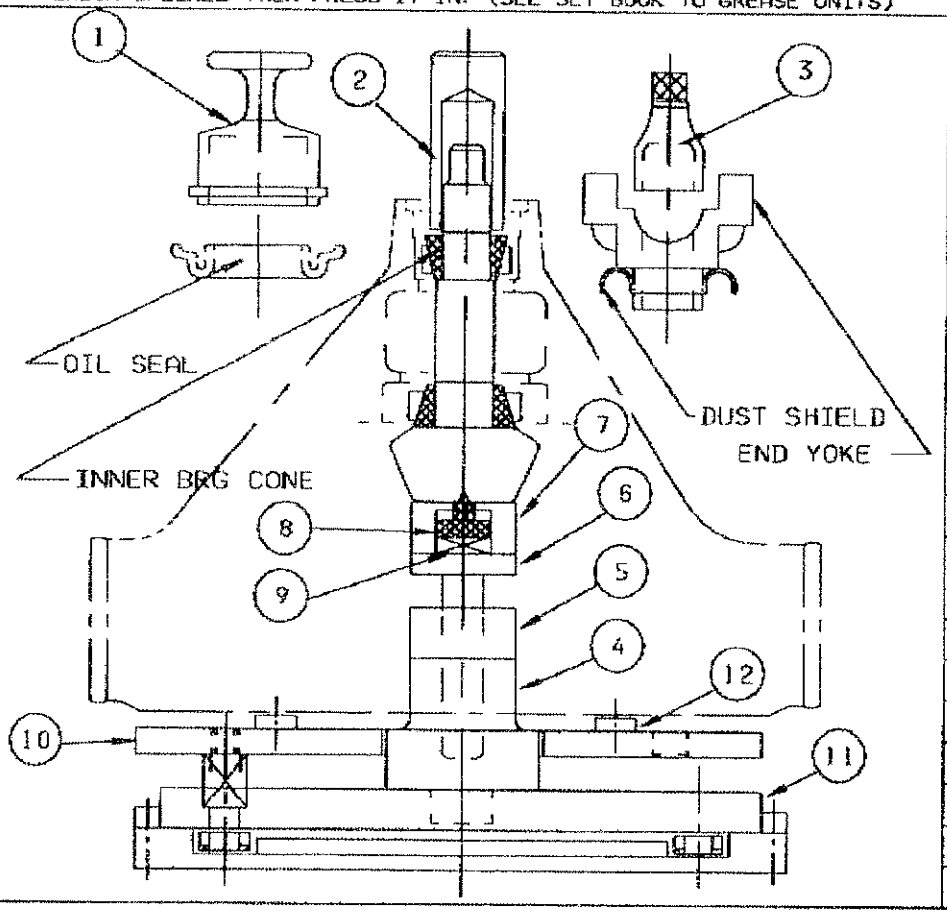
Attachment 5
Page 2 of 6
Reference L-377F

FORM #900-007.REV 12/15/96

PART NAME CARRIER ASSY	FILE: 950FL52-1	ENGINEERING SPEC.	DANA SPEC. NO.	NO.	LET	CHANGE	BY	DATE	ISSUE DATE 2-96	SHEET 1 OF 1	
BASIC OPERATION ASSEMBLE PINION INTO CARRIER		GREASE			A	REVISED PS	SN	1/97	PART NO. ALL	MODEL NO. ALL	
MACH TYPE #8 LOGAN PRESS	MACH. NO. 08-02-08	(PER PRINT SPEC)							DEPT NO. 950FL	OPER. NO. 52	
									TOOL No. ST-7018		

OPERATION DESCRIPTION

LOCATE PINION W/BEARING ASS'Y ON POST & PLACE CARRIER OVER IT.
PLACE SHIM PACK & SMALL BEARING CONE ONTO PINION-USE BEARING DRIVER
TO PRESS IT IN -APPLY GREASE ON BEARING & ADD THRUST WASHER-
PLACE OIL SEAL ON CARRIER AND PRESS IT IN PLACE-AND INSTALL END YOKE
ON PINION SPLINES THEN PRESS IT IN. (SEE SET BOOK TO GREASE UNITS)



REF. NO.	NO. REQ'D	TOOL'S DESCRIPTION	MODEL & TOOL'S DETAIL No. 30	44	60	70	70HD
1	1	OIL SEAL DRIVER	107	107	107	107	107
2	1	BEARING DRIVER	109	109	109	109	109
3	1	END YOKE DRIVER	108	108	108	108	108

PINION-CARRIER-FIXTURE FILE: CAD.SAMMY: DRIVE C

4	1	SUPPORT BODY	7				
5	1	SHIM	NONE	3	4	5	6
6	1	GUIDE POST	2				
7	1	TOP PLATE	8				
8	1	LOCATOR PIN	1				
9	1	TENSION SPRING	STANDARD				
10	1	TOP-SLIDE PLATE	24				
11	1	BOTTOM SLIDE PLATE	4				
12	4	REST PLATES	19				

100% VISUAL INSPECTION FOR COMPLETE PRESS UP AND THE PRESENCE OF THE OTHER REQUIRED COMPONENTS

SPECIAL NOTES: REFER TO THE PRINT AND FOLLOW THIS PROCESS

SPECIAL NOTES DUST SHIELD MUST BE INSTALLED ON ENDYOKE BEFORE ANY OPERATION

Attachment 5
Page 3 of 6
Reference 1-37F

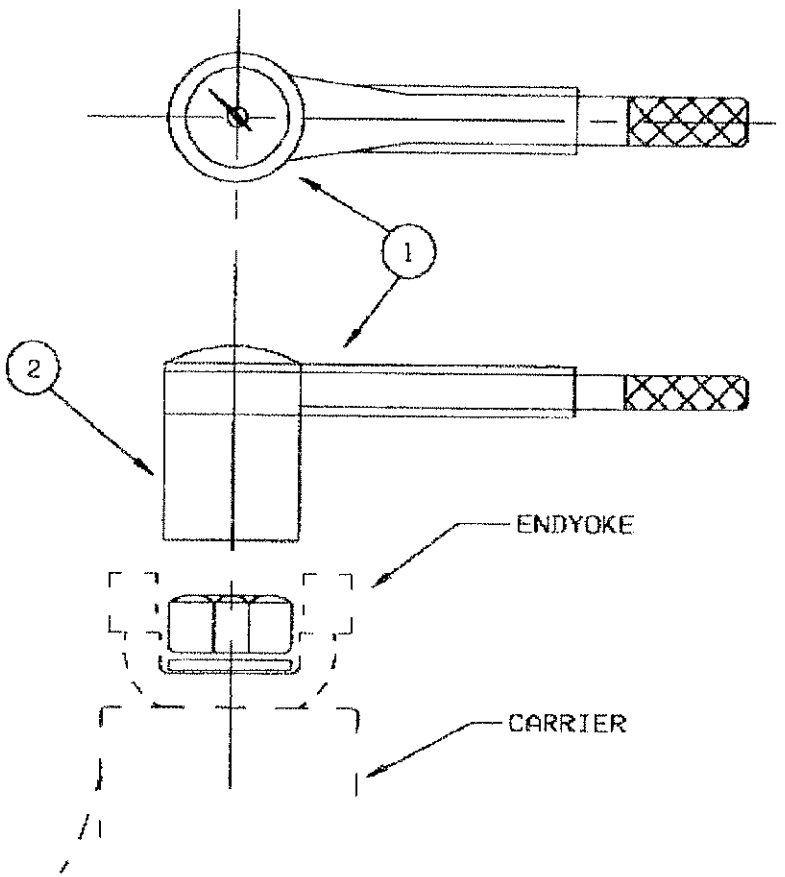
FORM H900-007.REV 12/15/95

PART NAME CARRIER ASSY	FILE: 950FL60-2	ENGINEERING SPEC.	DANA SPEC. NO.	NO.	LET	CHANGE	BY	DATE	ISSUE DATE 2-96	SHEET 2 OF 3
BASIC OPERATION CHECK PRE-LOAD					A	REVISED PS	SN	1/97	PART NO. ALL	MODEL NO. ALL
MACH TYPE -	MACH. NO. N/A								DEPT NO. 950FL	OPER. NO. 60
OPERATION DESCRIPTION		(PER PRINT SPEC)							TOOL No. AS SHOWN	

PLACE TORQUE WRENCH WITH SOCKET ON PINION NUT -

ROTATE PINION ASS'Y - THRU ONE COMPLETE REVOLUTION -

READ TORQUE - REWORK IF ABOVE OR BELOW LIMITS.



REF. NO.	NO. REQ'D	TOOL'S DESCRIPTION	MODEL & TOOL'S DETAIL No.				
			30	44	60	70	70HD
1	1	0-50 IN-LB TORQOMETER					
		SER. No. 21071					
2	1	HEX SOCKET	1-1/8		1-5/16		

MODEL No.	PRE-LOAD (IN-LB)	GAGE FREQUENCY
30	15-35	100%
44	20-40	100%
60	20-45	100%
70	20-45	100%
70HD	20-45	100%

Attachment 5
Page 1 of 6
Reference 1-37F

SPECIAL NOTES: REFER TO THE PRINT AND FOLLOW THIS PROCESS

Chevron Dura-Lith® Greases EP
NLGI 000, 00, 0, 1, 2, 3

Chevron Dura-Lith Greases EP deliver value through

- **High film strength**
- **Good water resistance**
- **Good corrosion protection**
- **Good oxidation stability**
- **Simplified lubrication**
- **Economy**
- **Low oil bleeding tendency**

Chevron Dura-Lith Greases EP are multipurpose extreme pressure greases manufactured using selected highly refined medium viscosity index base oils, a lithium 12-hydroxystearate thickener, an extreme pressure additive, and rust and oxidation inhibitors.

Chevron Dura-Lith Greases EP are widely accepted by the industry for use in centralized lubrication systems. Chevron Dura-Lith Greases EP can satisfy most industrial grease applications. They are recommended for both plain and antifriction bearings and particularly for bearings subjected to shock loading. Grades NLGI 1 and 2 comply with Timken's recommendation for this service. Grades NLGI 00, 0, and 1 are recommended for centralized lubrication systems.

NLGI 000 is a semi-fluid grease formulated to meet the lubrication requirements of underground mining machinery having enclosed gear cases where housings and seals have lost their ability to retain conventional gear oils.

NATIONAL LUBRICATING GREASE INSTITUTE
NLGI
AUTOMOTIVE CHASSIS LUBRICANT
LB

Grades NLGI 1 and 2 are approved for the NLGI Certification Mark LB.

All NLGI grades are authorized by USDA as H2 lubricants with no food contact.

Chevron Dura-Lith® Greases EP *(continued)*

NLGI Grade	000	00	0
CPS Number	*254593*	*254597*	*254598*
MSDS Number	*7683*	*7683*	*7683*
Penetration, at 25°C(77°F)			
Unworked	445	415	390
Worked	460	415	370
Dropping Point, °C(°F)	160(320)	160(320)	171(340)
Timken OK Load, lb	40	40	40
Thickener, %	1.6	2.3	4.1
Type	Lithium	Lithium	Lithium
ISO Viscosity Grade, Base Oil Equivalent	320	100	100
Viscosity, Kinematic*			
cSt at 40°C	349	112	112
cSt at 100°C	22.3	9.8	9.8
Viscosity, Saybolt*			
SUS at 100°F	1880	595	595
SUS at 210°F	112	60	60
Viscosity Index*	76	49	49
Flash Point, °C(°F)*	224(435)	204(400)	204(400)
Pour Point, °C(°F)*	-27(-17)	-24(-11)	-24(-11)
Texture	Stringy	Buttery	Buttery
Color	Red	Amber	Amber

* Determined on mineral oil extracted by vacuum filtration.

Attachment 5
Page 5 of 6
Reference L-37F

Chevron Dura-Lith® Greases EP *(continued)*

NLGI Grade	1	2	3
CPS Number	*254596*	*254595*	*254594*
MSDS Number	*7683*	*7683*	*7683*
Penetration, at 25°C(77°F)			
Unworked	305	275	210
Worked	325	280	235
Dropping Point, °C(°F)	186(367)	188(370)	193(379)
Timken OK Load, lb	40	40	40
Thickener, %	5.6	6.4	9.1
Type	Lithium	Lithium	Lithium
ISO Viscosity Grade, Base Oil Equivalent	220	220	220
Viscosity, Kinematic*			
cSt at 40°C	195	195	195
cSt at 100°C	13.3	13.3	13.3
Viscosity, Saybolt*			
SUS at 100°F	1051	1051	1051
SUS at 210°F	73	73	73
Viscosity Index*	40	40	40
Flash Point, °C(°F)*	249(480)	249(480)	249(480)
Pour Point, °C(°F)*	-18(0)	-18(0)	-18(0)
Texture	Buttery	Buttery	Buttery
Color	Amber	Amber	Amber

* Determined on mineral oil extracted by vacuum filtration.

Chevron Moly Greases EP
NLGI 1, 2

Chevron Moly Greases EP deliver value through

- **Good water and heat resistance**
- **Good corrosion protection**
- **Good oxidation stability**
- **Good pumpability**
- **Good wear protection**
- **Extended lubrication frequencies**

Chevron Moly Greases EP are general purpose, extreme pressure (EP) greases manufactured using highly refined selected base oils, a lithium-12-hydroxystearate thickener, 3% molybdenum disulfide (moly), EP additive, rust and oxidation inhibitors. These products satisfy the demand for high quality moly-type greases with extreme pressure capability in both automotive and industrial applications.

Typical applications in automotive equipment are: chassis, bearings, universal joints, fifth wheels, and ball joints in construction equipment such as bulldozers, scrapers, loaders, shovels, etc. Chevron Moly Greases EP are recommended for use in roller chains, trunions, gears, cables, sheaves, slides, and chassis bearings. In industrial applications, these greases are recommended for the lubrication of conveyor bearings, sliding and rubbing surfaces, kiln car bearings, etc. They are particularly suited for heavily loaded pivot pins, splined shafts, or other surfaces subjected to sliding, vibration, or oscillation where fretting is encountered.

8/5/04

ASTM L-37 Axle Assembly Requirements

1. Build total order continuously without interruption. Use only the carrier lot designated for this order.
2. Stamp cover plate surface of housing with date and shift identification (eg 127-04A where 127 is the Julian date, 04 is the year and "A" is the shift).
3. Use pattern position chart to evaluate ring and pinion contact pattern. Shim to optimize drive side pattern.
4. Accept only patterns designated by Engineering.
5. Mark on housing, torque to turn, backlash, and pattern (e.g. L2F0)
6. At paint, do not paint over markings.
7. * After paint, divide axles as they come out, randomly ~~between the labs. This may be done one pallet at a time. (i.e. 1 pallet for Lubrizol, the next pallet for Ethyl, the next pallet for Southwest Research and then repeat the sequence).~~ DO NOT FILL ONE LAB'S ORDER AND THEN START ON THE NEXT ORDER.
8. Packaging is to consist of 16 axles per pallet, with outside measurement of loaded pallet not to exceed 60"high, 53" deep, 63" wide.
9. Place tag on each pallet with heat code identification of the ring and pinion.

* FILL/BUILD ONE AXLE TO PALLET, ROTATING BETWEEN 4 PALLETS until 16 Axles per PALLET = 48 Axles Built

i.E

Axle Build Continious

PALLET 1	AFTON	1 5 9 13 ... 64	
PALLET 2	LZ	2 6 10 14 ... 62	AND SO ON
PALLET 3	SRI	3 7 11 15 ... 63	
PALLET 4	PARC	4 8 12 16 ... 64	

ABOVE NOW = 1 full pallet for each LAB Then PUT 4 more pallets on FLOOR, start with Build # 65 etc. To Completion of all axles

Attachment 6
Page 10/1
Reference L-37TF

Bartlett, Donald

From: Kenny.Miller@dana.com

Sent: Wednesday, January 04, 2006 3:32 PM

To: Don.Kreinbring@dana.com

Cc: Bartlett, Donald; Steve.Bird@dana.com; Gene.Lawrence@dana.com; Jeff.Belton@dana.com; Steve.Roller@dana.com

Subject: ASTM L-37 audit of first build at Lugoff.

Attachments: 060GA105X L-37 diff build Lugoff 12-12-05.ppt

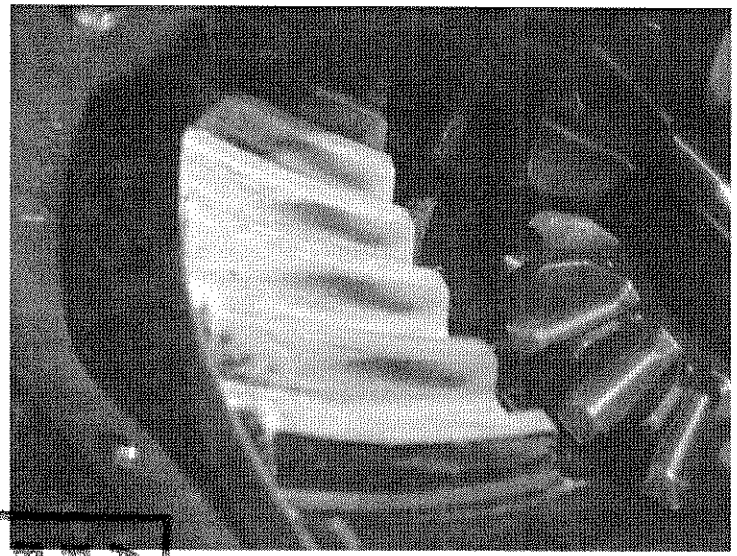
Don,
I traveled to Lugoff on December 12th to audit/assist with the first build of the ASTM axles for the current L-37 order, ref. gearset P/N 060GA105X (non-lubrited).

I stayed with the guys on the assy line and photograped & recorded data from the first six consecutive axles. I was then away from the line for an hour or so, came back, and recorded another two axles. Perhaps 15-20 axles had been built by the time I got back. In summary, the initial builds went very well. I had the guys to reshim a couple of diffs at the start but after a couple of very slight adjustment (one for pinion postion and one for backlash), we were off to a good start. I conveyed to the guys on the line the absolute need for consistency in the build patterns and gave them a good idea of the parameters with which they were to stay within. I left my home phone with Gene in case of any snags as I began Christmas break on the 14th. No one called with any problems, so I believe this build order has gone OK. Please see the file below for the build patterns and other data:

Any questions about this report, please call.

Kenny Miller, Gear Engineer
Spicer Off-highway Products
1293 Glenway Dr, Statesville, NC 28625
phone: (704) 878-5762
fax: (704) 878-5760
email: kenny.miller@dana.com

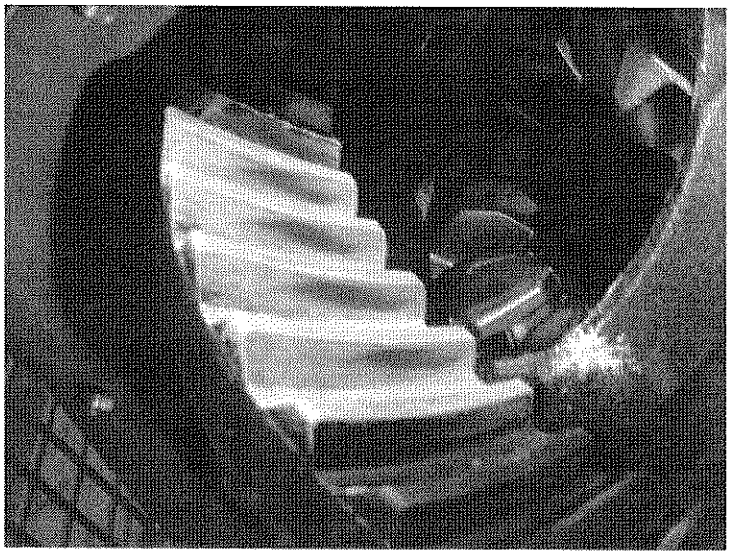
Attachment 7
Page 1 of 3
Reference L-37IF



RT = 45 in-lbs
B/L = .005"
Pos = L2F0

1st diff

RT = 40 in-lbs
B/L = .005"
Pos = L2F0



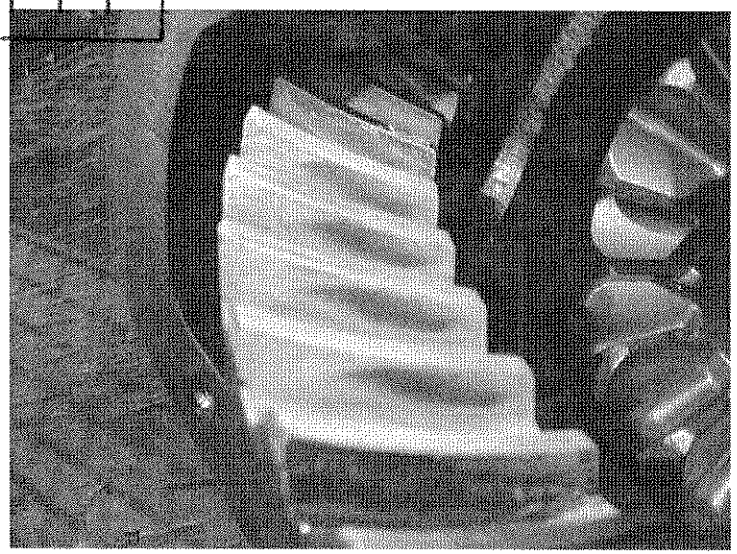
2nd diff

Attachment 7
Page 2 of 3
Reference 137TE

ASTM L-37 (1st axle build at Lugoff) hypoid P/N 060GA105X, 5.86 ratio, LH, non-lubrited

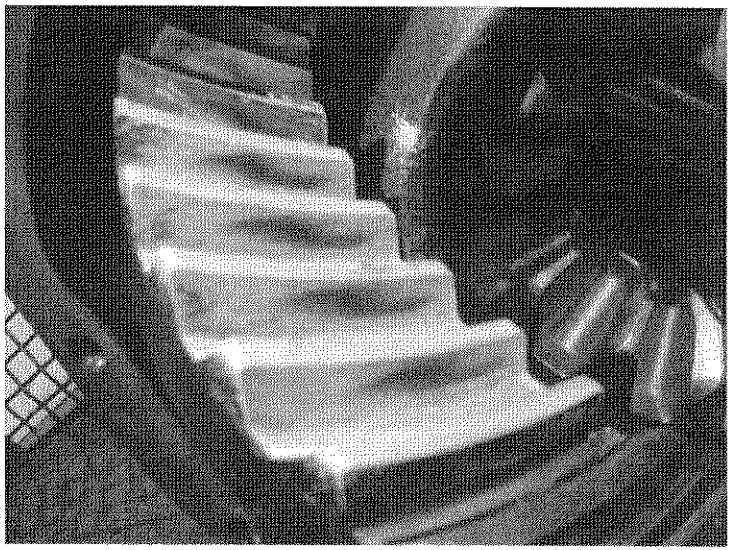
12/12/2005

3rd diff

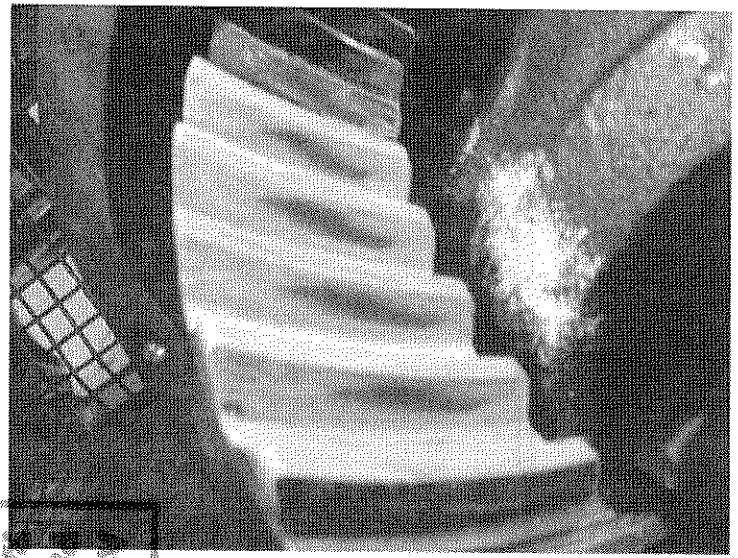


RT = 40 in-lbs
B/L = .007"
Pos = L2F0

4th diff



RT = 40 in-lbs
B/L = .005"
Pos = L2F-1



RT = 40 in-lbs
B/L = .009"
Pos = L2F0

5th diff

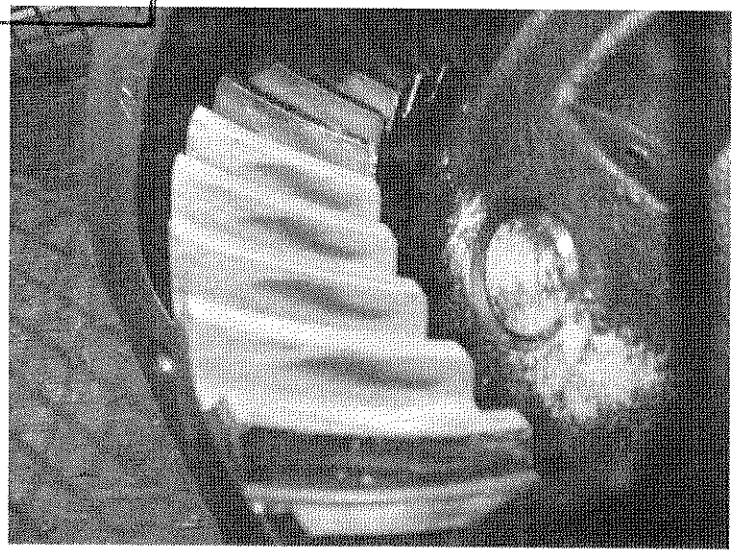
RT = 40 in-lbs
B/L = .007"
Pos = L2F-1

6th diff

ASTM L-37 (1st axle build at Lugoff) hypoid P/N 060GA105X, 5.86 ratio, LH, non-lubrited

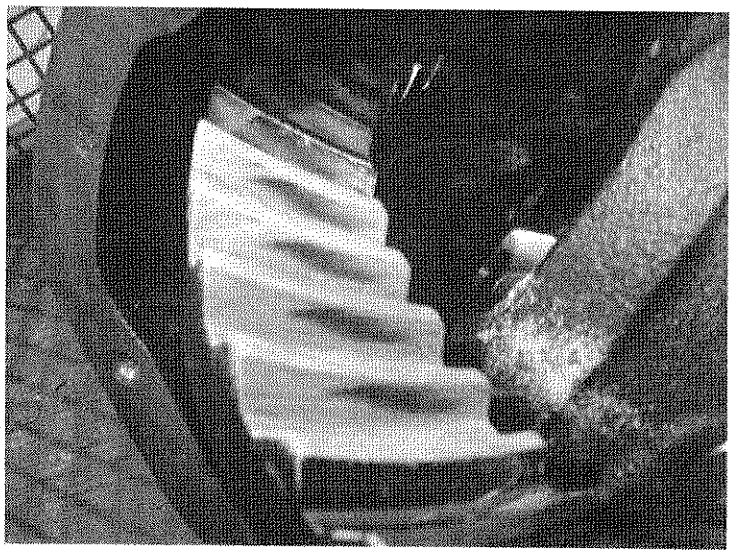
12/12/2005

later diff



RT = 40 in-lbs
B/L = .005"
Pos = L2F0

later diff



RT = 20 in-lbs
B/L = .010"
Pos = L2F0

Attachment 8
Page 1 of 10
Reference 4.2.2.F

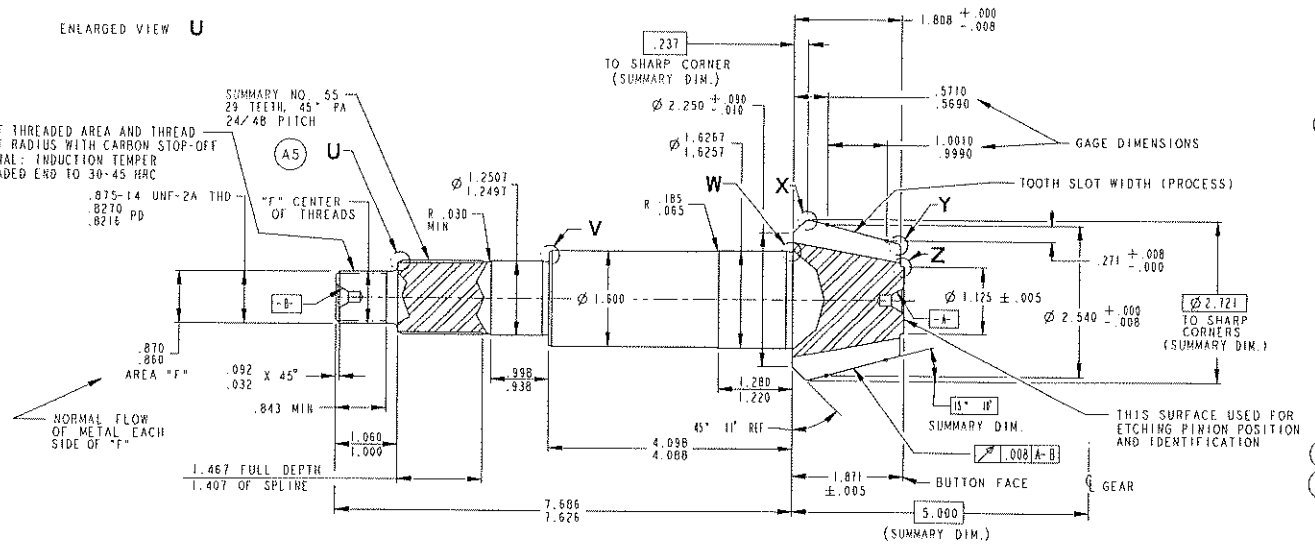
CHANGE NO.	REV	CHANGED FROM	SHT	ZONE	DATE	CHG BY	APP BY
M96-203	--	RELEASED FOR PRODUCTION	--	--	3-26-96	--	GM
7568.62.0	--	CONVERTED FROM 1/G TO PRO-E W/O CHANGE	--	--	23JAN02	JL	RD
	A1	REMOVED NOTE (AD AREA"A"	--	C5			
	A2	REMOVED NOTE (APPROVED PEENING SOURCES	--	B3			
	A3	REMOVED NOTE (THE RING AND PINION	--	B3			
	A4	CASE DEPTH WAS .030 TO .060	--	A1			
	A5	WAS AREA "A"	--	C7			
93 0022.00-51	B	WAS 58-63 HRC & ADDED AUSTENITE NOTE	1	C2	1-15-03	RB	JL
93 0345 02-51	C	ADDED POLISH TEETH NOTE TO PINION	1	B3	3-2-93	RB	JL
94 0218.00-51	D	ADDED OPTIONAL 38-45 HRC NOTE	1	D8	26JUL104	RB	JL

CHANGE ONLY ON Pro/E CAD SYSTEM

ENLARGED VIEW U

ENLARGED VIEW X

ENLARGED VIEW Z



NOTES:

SEE PROCESS SPEC 504 FOR STRAIGHTENING PROCEDURES

SEE ENGINEERING SPEC 214 FOR IDENTIFICATION MARKS AND THEIR LOCATIONS

SEE ENGINEERING SPEC 219 FOR LOCATION OF MANUFACTURING IDENTIFICATION MARKS

FINISH ALL OVER

(A1) HARDNESS: SURFACE 61-63 HRC RETAINED AUSTENITE (B) NOT TO EXCEED 10% VISUALLY

ALL ANGLES ±5° UNLESS OTHERWISE SPECIFIED

ONE HEAT OF STEEL WILL BE USED FOR THE LOT RUN. SUFFICIENT FIRE DISTORTION CHECKS WILL BE RUN TO DETERMINE THE DISTORTION PROBLEMS AND POSITION CHANGES NECESSARY. THIS NORMALLY WILL BE FROM 20 TO 25 RING GEARS AND 5 TO 15 PINIONS. IF THE PARTS ARE ACCEPTABLE THEY MAY BE INCLUDED WITH THE ORDER, IF NOT THEY MUST BE SCRAPPED.

RING GEARS WILL BE CUT AND ACCUMULATED AHEAD OF THE CARBURIZING FURNACE. WHEN THE ENTIRE LOT IS CUT, THEY WILL BE PROCESSED AT THE SAME TIME THROUGH ONE FURNACE ONLY.

PINIONS WILL BE CUT AND PROCESSED IN THE SAME MANNER AS THE RINGS. IT IS NOT NECESSARY THAT THEY BE RUN IN THE SAME CARBURIZER AS THE RINGS, BUT THEY MUST BE BE PROCESSED AT THE SAME TIME AND ALL THROUGH ONE FURNACE.

(A3) (A2) SHOT PEEN AFTER TEMPERING AND PRIOR TO LAPPING. PEEN EACH GEAR TOOTH ROOT WITH S330 HARD SHOT (58-65 RC) 7.5-9C ARC HEIGHT, 200 MINIMUM COVERAGE

NO RE-LAP GEARS WILL BE USED.

PINION IS NOT TO BE LUBERIZED

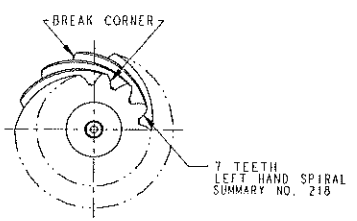
(C) TOP LAND EDGES OF PINION TEETH TO BE POLISHED, REMOVING THE SHARP EDGE.

RATIO 5.86 (41-7)
TYPE OF CUTTING 2G
MATES WITH GEAR (060GR105)
MATCHED PINION & GEAR ASSY 060GA105X
PER ENGRG SPEC 248

MATERIAL: STEEL PER MAT'L. SPEC FW-1
SAE 8625, OPTIONAL STEELS GROUP C

ENLARGED VIEW V

ENLARGED VIEW Y



ENLARGED VIEW W

UNLESS OTHERWISE SPECIFIED:
.XX ± .03
.XXX ± .010
XXXX ± BASIC
CHAMFERS ± 5°
ANGLES ± 1°

CONCERNS DIMENSIONING & TOLERANCING PER ANSI Y14.5M

<KC> KEY CHARACTERISTIC PER ENGINEERING PROCEDURE (EP-004)

DIM ARE IN INCHES
DIM IN [ ] ARE MM

WEIGHT
SCALE FULL

	DATE	NAME
DWN	3-26-96	L.WILSON
CHK	3-26-96	R.JH.
ENG	3-26-96	GM
MFG		
STR		
MFG		

MATERIAL: SEE NOTES
TREATMENT: FW-204
ROUGH NO: 060GP103
HARDNESS: SEE NOTES (A4) CASE DEPTH .050-.065
REF NO: 060GP102

PINION - HYPOID DRIVE - FINISHED

DANA SPICER OFF-HIGHWAY PRODUCTS DIVISION STATESVILLE, NC

060GP105

SHEET 1 OF 1

REV D

DIN TOL (mm)

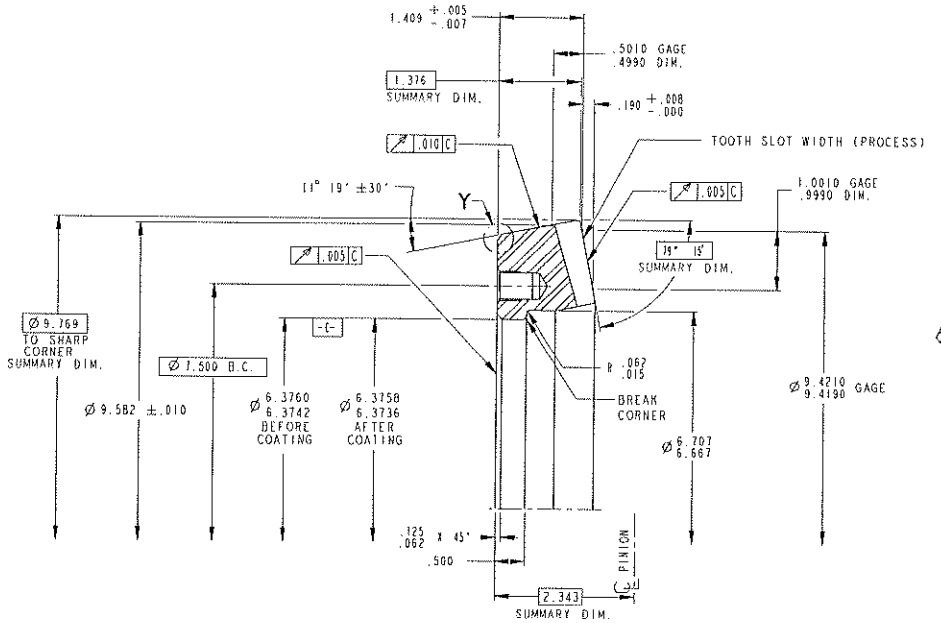
EPR 0298

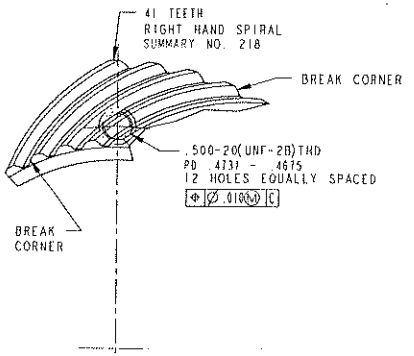
MODEL 60

Attachment 5
Page 2 of 2
Reference 2-37TF

CHANGE NO.	REV	CHANGED FROM	SHT	TOWC	DATE	ENG BY	APP BY
MRR-203	--	RELEASED FOR PRODUCTION	--	--	3-26-96	--	GM
T586.02.0	--	CONVERTED FORM 1/0 TO PRO-E W/O CHANGE	--	--			
	A7	REMOVED NOTE (APPROVED PEENING SOURCES)	--	B5	74JA802	JL	KD
	A8	REMOVED NOTE (THE RINGS AND PINIONS	--	B5			
	A3	WAS .60 TO .80 MIN CASE DEPTH .025 TO .040	--	A1			
03 0222 00-S1	B	WAS .58-.63 ARC & ADDED AUSTENITE NOTE	--	C2	1-15-03	RB	JL
04 0198 00-S1	C	WAS 61-63 ARC & REMOVED AUSTENITE NOTE	--	C2	04APR04	JBL	KD

CHANGE ONLY ON Pro/E CAD SYSTEM





GENERAL NOTES:

SEE ENGINEERING SPEC 219 FOR LOCATION OF MANUFACTURING IDENTIFICATION MARKS

FINISH ALL OVER

(C) (B) HARDNESS: SURFACE 58-60 HRC.

ONE HEAT OF STEEL WILL BE USED FOR THE LOT RUN SUFFICIENT FIRE DISTORTION CHECKS WILL BE RUN TO DETERMINE THE DISTORTION PROBLEMS AND POSITION CHANGES NECESSARY. THIS NORMALLY WILL BE FROM 20 TO 25 RING GEARS AND 5 TO 15 PINIONS. IF THE PARTS ARE ACCEPTABLE THEY MAY BE INCLUDED WITH THE ORDER, IF NOT THEY MUST BE SCRAPPED.

RING GEARS WILL BE CUT AND ACCUMULATED AHEAD OF THE CARBURIZING FURNACE. WHEN THE ENTIRE LOT IS CUT, THEY WILL BE PROCESSED AT THE SAME TIME THROUGH ONE FURNACE ONLY

PINIONS WILL BE CUT AND PROCESSED IN THE SAME MANNER AS THE RINGS. IT IS NOT NECESSARY THAT THEY BE RUN IN THE SAME CARBURIZER AS THE RINGS. BUT THEY MUST BE BE PROCESSED AT THE SAME TIME AND ALL THROUGH ONE FURNACE.

SHOT PEEN AFTER TEMPERING AND PRIOR TO LAPPING. PEEN EACH GEAR TOOTH ROOT WITH S330 HARD SHOT (58-65 RC) 7.5 - 9C ARC HEIGHT, 200 MINIMUM COVERAGE

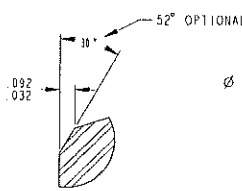
(A1) (A2)

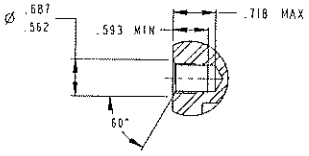
NO RE-LAP GEARS WILL BE USED.

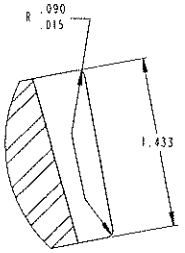
GEAR IS NOT TO BE LUBERIZED.

RATIO 5.86 (41-7)
TYPE OF CUTTING 2G
MATES WITH PINION (060GP105)
MATCHED PINION & GEAR ASSY 060GAP05X
PER ENGRG SPEC 248

MATERIAL: STEEL PER MATL SPEC FW-1
SAE 8620A, OPTIONAL STEELS GROUP H







UNLESS OTHERWISE SPECIFIED:
.XX ± .03
.XXX ± .010
[.XXX] = BASIC
CHAMFERS ± 5°
ANGLES ± 1°

GEOMETRIC DIMENSIONING & TOLERANCING PER ANSI Y14.5M	<XC> PER CHARACTERISTIC PER ENGINEERING PROCEDURE (EP 0701)		MATERIAL: SEE NOTES	TREATMENT: FW-204	
	DIM ARE IN INCHES / DIM IN [ ] ARE MM	WEIGHT / SCALE: FULL	ROUGH NO: 060GR103	HARDNESS: CASE DEPTH .040 TO .055 (A3)	
	DATE / NAME		REF NO: 060GR102		
	DWN: 3-26-96 L. WILSON		GEAR - HYPOID DRIVE - FINISHED		
	CHK: 3-26-96 RJH				
	ENG: 3-26-96 GM				
	WGT				
	STR				
REV C	MFG	DANA SPICER OFF-HIGHWAY PRODUCTS DIVISION WATERVILLE, HC	060GR105	SHEET 1 of 1	
	DIM / TOL (±m)		D EPR 0296	MODEL 60	

CHANGE NO.	REV	CHANGED FROM	SHT	ZONE	DATE	CHG BY	APP BY
M96-203	--	RELEASED FOR PRODUCTION	--	--	3-26-96	--	GM
7568.02.0	--	CONVERTED FROM I/G TO PRO-E W/O CHANGE	--	--	23JAN02	JL	KO
	A	REMOVED APPROVED PEENING SOURCE	--	B2			

CHANGE ONLY ON Pro/E CAD SYSTEM

PINION & GEAR ARE MATCHED AT BEST OPERATING POSITION. SERIAL NUMBERS ARE ASSIGNED TO EACH SET & SAME NUMBER ETCHED ON PINION AND GEAR. FOR SERVICE-MATCHED SET TO BE PACKED IN A SEALED CARTON AND LETTER -S- ADDED TO SERIAL NUMBER ON GEAR ONLY. PINION AND GEAR ARE FURNISHED IN MATCHED SETS ONLY.

SHOT PEEN AFTER TEMPERING AND PRIOR TO LAPPING. PEEN EACH GEAR TOOTH ROOT WITH S330 HARD SHOT (58-65 RC) 7.5-9C ARC HEIGHT, 200 MINIMUM COVERAGE.

Attachment 8
Page 3 of 10
Reference L-377F

(A)

ITEM	PART NO.	QTY.	NAME OF PART
101	060GP105	1	PINION-HYPOID DRIVE FIN.
102	060GR105	1	GEAR-HYPOID DRIVE FIN.

GEOMETRIC DIMENSIONING & TOLERANCING PER ANSI Y14.5M
W.O.# M96-203
REV A
DIM
TOL (μm)

<KC> KEY CHARACTERISTIC PER ENGINEERING PROCEDURE (EP-026)

DIM ARE IN INCHES
DIM IN [ ] ARE MM

	DATE	NAME
DWN	3-26-96	L.WILSON
CHK	3-26-96	RJH
ENG	3-26-96	GM
MET		
STR		
MFG		

DANA SPICER OFF-HIGHWAY PRODUCTS DIVISION STATESVILLE, NC

MATERIAL
TREATMENT
WEIGHT
SCALE NONE
ROUGH NO
HARDNESS
REF NO 060GA101X

GEAR PINION ASSY
HYPOID DRIVE

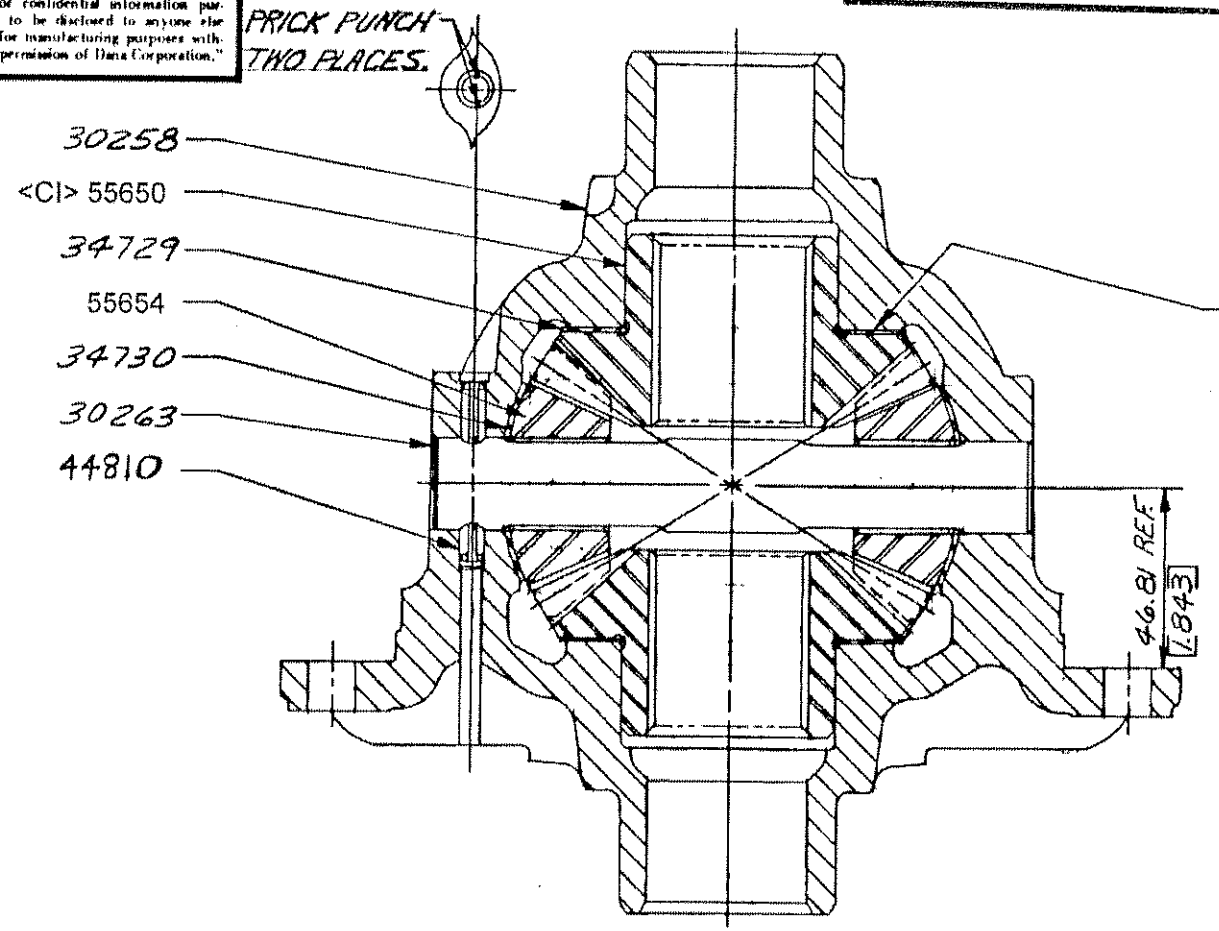
060GA105X

SHEET 1 OF 1

B EPR 0295 MODEL 60

Attachment 8
Page 4 of 10
Reference L-37TF

NO.		CHANGED FROM	DR.	CH.	DATE
05 0247.00-S1	--	PRODUCTION REL	JRL	KO	22AUG05



TOTAL CLEARANCE WITH FACE OF BOSS NOT TO EXCEED .2 [.008]. SIDES GEARS MUST TURN WITH 305 [12.000] HAND WRENCH.

NOTE: USE WITH MODEL 60-4.56 THRU 7.17 RATIOS

DIMENSION IN [ ] ARE INCHES.

THIRD ANGLE PROJECTION

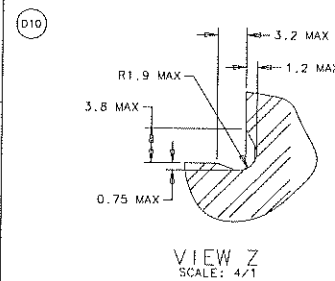
<CI> PER ENGRG SPEC 248

MAKE FROM SEE DRAWING	CASE ASS'Y. - DIFF.		
MATERIAL NO.			
HEAT TREAT'T NO.			
HARDNESS	W O 05.0247.00-S1	MODEL 60-2	
	DATE 22AUG05	SCALE	
	DRAWN BY JRL	CHECKED BY KO	

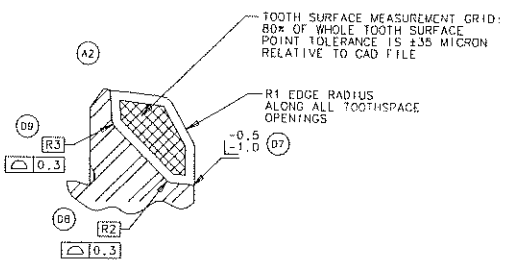
DANA CORPORATION
SPICER AXLE DIVISION
FT. WAYNE, INDIANA

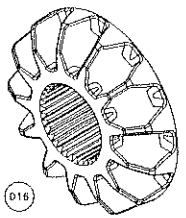
PART NO. 060DA102X SIZE C

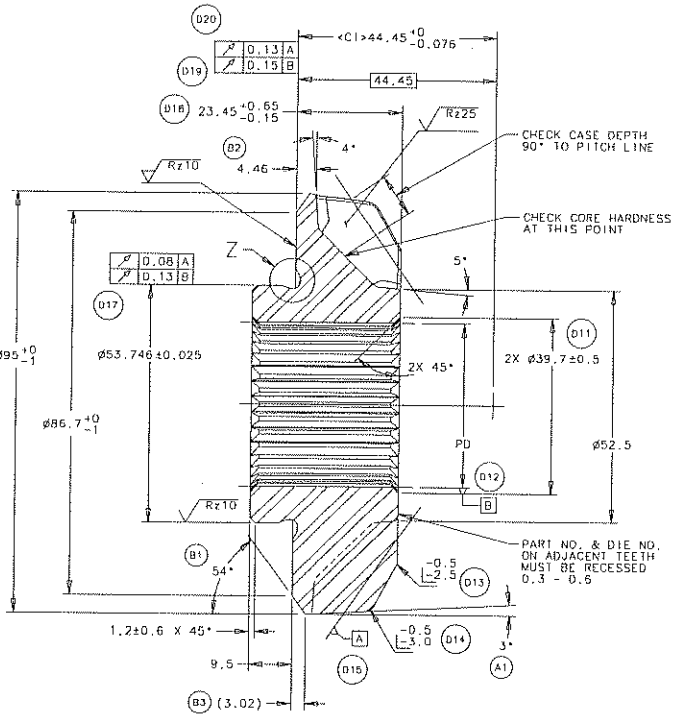
BRUNING 40-21

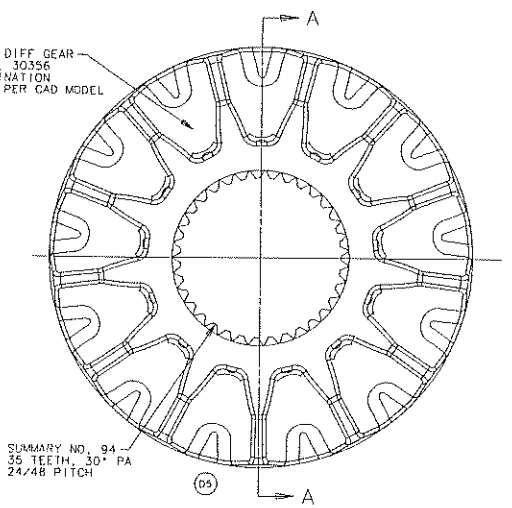


VIEW Z
SCALE: 4/1









NO	REV	ZONE	CHANGED FROM	DR	CHK	DATE
	1	B-9	DIMENSION ADDED			
0000797	A 2	G-8	DIMENSION REMOVED	RH	JT	04-30-03
	1	C-11	28°			
	2	E-11	4.56			
0001438	B 3	B-11	(7.81)	CM	JT	07-28-03
0001438	C 1		RELEASED TO PRODUCTION		TS	07-28-03
	1	E-3	ADDED NOTE			
	2	C-3	CORE AT TOOTH ROOT 35-45 RC			
	3	C-3	<CI> CASE DEPTH: 0.80-1.20			
	4	C-3	ADDED NOTE			
	5	B-5	ADDED VIEW			
	6	E-7	REVISED NOTE			
	7	G-6	R1.4			
	8	F-8	R2			
	9	C-8	R3			
	10	H-12	REMOVED TABLE			
	11	D-8	2X ø39.42 MIN			
	12	C-9	ADDED DATUM B			
	13	B-9	R3			
	14	B-9	R3			
	15	B-10	RELOCATED DATUM A			
	16	G-4	ADDED VIEW			
	17	D-11	ADDED GEOM TOL			
	18	E-11	23.45 +0.15 -0.00			
	19	F-11	ADDED GEOM TOL			
0005622	D 20	F-11	REVISED GEOM TOL	CM	WH	03-27-04
	1	E-3	NOTES FORMAT UPDATED			
0009153	E 2	E-3	NOTE ADDED	RM	CR	07-18-05

E2 FOR MANUFACTURING PURPOSES ONLY

"G" SUFFIX ON PART IDENTIFIES THIS PART AS BEING RECEIVED IN AS A GREEN PART

E1 NOTES:

D1 <CI> TOOTH QUALITY - AGMA 390.03a CLASS 9 MIN

PART MUST BE FREE FROM ALL NICKS, BURRS, SHARP EDGES AND CORROSION

PART MUST CONFORM TO SPECIFICATION ES-0308 (INTERNAL SPLINE TAPER)

PART MUST CONFORM TO SPECIFICATION ES-0228 (DIFFERENTIAL GEAR TOOTH CONTACT PATTERN ACCEPTABILITY)

MATERIAL: STEEL SAE 8620R OPTIONAL STEELS GROUP E PER SPECIFICATION ES-PM-FW0001

HEAT TREAT PER SPECIFICATION ES-HT-FW0204

HARDNESS: SURFACE 57 HRC (88.9 R15N) MIN

D2 CORE AT TOOTH ROOT 30-45 RC

D3 <CI> CASE DEPTH: 0.64 TO 1.14

D4 ISO 13715

METRIC

MAKE FROM	PART MUST CONFORM TO ENGRD SPEC 280
REF DRAWING	<CI> PER SPECIFICATION ES0001D060
STACKUP NO.	DIMENSIONS ARE IN MILLIMETERS
LAYOUT NO. L-2173	
APPROX WT 0.81 Kg	REF DRAWING STANDARDS ASME Y14.5M - 1994
MATERIAL SEE NOTE	UNLESS OTHERWISE SPECIFIED: FINISHED TOL: ±.0.25 ANGLE TOL: ± 2°
HEAT TREAT SEE NOTE	SPECIFICATIONS: SPICER TECHNOLOGY, INC
HARDNESS SEE NOTE	
DRAWN BY BH	SPICER TECHNOLOGY, INC SUBSIDIARY OF DANA CORPORATION FT. WAYNE, INDIANA
CHECKED JT	GEAR - NET FORMED DIFF FIN
DATE 03-20-03	
SCALE 2/1	
MODEL 248	SIZE A1
PART CODE 0881	PART NO. 55650 REV E
WORK ORDER 22001-048	

CHANGE ONLY ON SDRC

Attachment 8
Page 5 of 10
Reference 1.37F

Attachment 8
Page 6 of 10
Reference [illegible]

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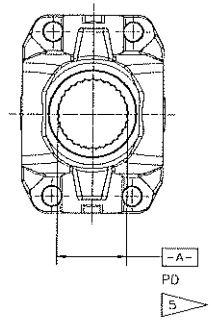
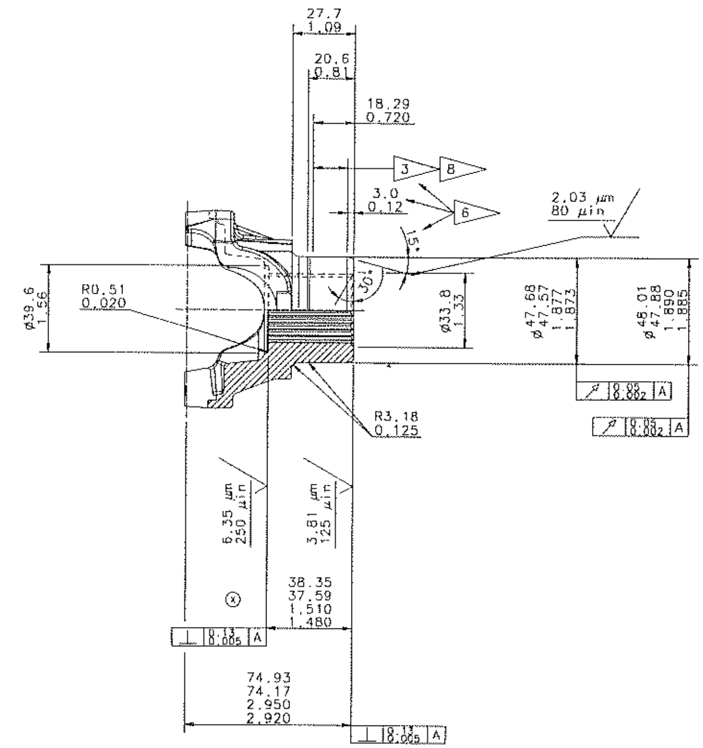
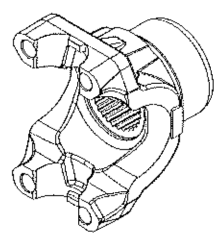
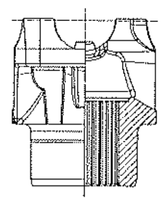
SYM.	UNLESS OTHERWISE SPECIFIED	
1	REMOVE ALL BURRS	
3	MINIMUM LENGTH OF 0.50 / 0.25 µm / 20 / 10 µin	(AC)
4	FOR CROSS HOLE AND LUG MACHINING SEE SUMMARY CHART	
5	FOR SPLINE DATA SEE SUMMARY CHART 1.276-29-1-1J	
6	SEE 626J	
7	PART IS TO BE BALANCED TO 0.125 oz.in. OF UNBALANCE	
8	HEAT TREAT TO Rc C50 MINIMUM FOR THIS MINIMUM LENGTH	
9	MAKE FROM: C2-4-1479-1 MATERIAL: 93-4J HARDNESS: 293-235 BHN 3.95-3.55 BID OPTIONAL MAKE FROM: F2-4-2369 MATERIAL: SAE 1137 FINE GRAIN (5-8) HARDNESS: 269-229 BHN 4.00-3.70 BID	(V)(W) (T)
11	IDENTIFY WITH (SEE TAB)	(AA)









PART NUMBER	DESCRIPTION	MAKE FROM	4	11
2-4-3791	U-BOLT	9	1310-2	2-3791
2-4-3791-1	BEARING STRAP TAPPED HOLES	9	1310-3	2-3791-1

(AD)

APPLICATION		
MAKE	MODEL	REMARKS

MAXIMUM MOMENTARY JOINT OPERATING ANGLE 22.5° FORGED VERSION, 27° CAST VERSION

(BASED ON) 1.524 mm./0.060 in. CLEARANCE
NUT { 36.65 mm./1.443 in. ACROSS CORNERS; 15.88 mm./0.625 in. HEIGHT
WASHER { 3.05 mm./0.120 in. THICKNESS; 38.1 mm./1.50 in. O.D.

NO.	REV.	REVISIONS	ZONE	DR	CK	DR	CK	DATE
0061552	AD	REACTIVE	5C	BTL	TS	-	-	09-02-2003
C-164638	AC	NOTES REVISED	5C	SPB	TS	-	-	01-04-2001
C-164638	AB	NOTE ADDED	2A	SPB	TS	-	-	01-04-2001
C-164638	AA	NOTE 11 ADDED	5C	SPB	TS	-	-	01-04-2001
C-164638	Z	FLAG 10 REMOVED	5C	SPB	TS	-	-	01-04-2001
C-164041	Y	REDRAWN TO IDEAS WITHOUT CHANGE	-	DAB	WJW	DAB	WRJ	04-17-2000
C-152575	X	DIMENSION CORRECTED	2B	AA	TS	-	-	03-04-2000
C-182378	W	CHANGED	4B	EFK	TS	-	-	11-30-1999
C-182378	V	OPTIONAL ADDED	4B	AA	TS	-	-	07-05-1999
C-97520		ENGINEERING RELEASE		DCW				05-29-1999
		SAMPLE RELEASE						

GEOMETRIC CHARACTERISTIC SYMBOLS PER ANSI Y14.5M-1982

DIMENSIONS ARE MILLIMETERS / INCHES. UNLESS OTHERWISE SPECIFIED BY A TOLERANCE, ALL DIMENSIONS SHOWN ARE FOR REFERENCE ONLY.
ONE PLACE (.X) ± 0.5; TWO PLACE (.XX) ± 0.02 / ± 0.25; THREE PLACE (.XXX) ± 0.010; RADII ± 0.020 / ± 0.50; ANGLES ± 5°

WEIGHT
WR²

DO NOT SCALE PRINT

MAKE FROM: SEE TAB
MATERIAL / NO.
HARDNESS
E.O. C-97520
SCALE FULL SERIES 1310

NAME: END YOKE
DATE: 04-01-1966
DH | RH | DAB | WRJ
DRAWN | CHECKED | MODELED | CHECKED

DANA — SPICER DRIVESHAFT, INC., TOLEDO, OHIO
PART NO. 2-4-3791
REV. AD
REF: 2-4-4031

REVISION LEVEL 00 TRANS DATE 7/31/97, TRANS #45005-021, ENGR JEM

23 TEETH, 30.00 DEG PRESSURE ANGLE
PITCH 16/32 MODULE 1.58750/0.79375
EFFECTIVE FIT-0.0018in TO 0.0005in [-0.0457mm TO 0.0127mm], TIGHT TO LOOSE
NOMINAL FIT 0.0011in TO 0.0034in [0.0272mm TO 0.0856mm], LOOSE TO LOOSE
PITCH DIA. 1.4375in [36.5125mm], BASE CIRCLE DIA. 1.2449in [31.6208mm]

** MALE **
FLAT ROOT SIDE FIT

	INCH-MAX	INCH-MIN	MM-MAX	MM-MIN
MAJOR DIAMETER OF PART	1.5000	1.4950	38.1000	37.9730
MINOR DIAMETER OF PART	1.3585	1.3485	34.5059	34.2519
EFFECTIVE TOOTH THICKNESS	0.1000	0.0987	2.5400	2.5070
ACTUAL TOOTH THICKNESS	0.0985 REF	0.0972 REF	2.5019 REF	2.4689 REF
TRUE INVOLUTE FORM DIA MAX	1.3730		34.8742	
MEASUREMENT OVER TWO PINS, BASED ON ACTUAL TOOTH THICKNESS, IS FOR REF ONLY				
USE 0.1200in [3.0480mm] PINS	1.6203	1.6183	41.1559	41.1051

GO COMPOSITE RING GAGE TO CHECK MAX EFFECTIVE TOOTH THICKNESS
MINOR DIA .....= 1.3730in +.001/-0 [34.8742mm +.0254/-0]
MAJOR DIA TO CLEAR TIF DIA MIN = 1.5000in [38.1000mm]
MASTER PLUG GAGE TO CHECK RING GAGE TOOTH THICKNESS
RING GAGE TOOTH THICKNESS .....= 0.1000in [2.5400mm]
MAJOR DIA .....= 1.4950in +.001/-0 [37.9730mm +.0254/-0]
MINOR DIA TO CLEAR TIF DIA MAX = 1.3730in [34.8742mm]
TO MEASURE OVER TWO PINS .....= 1.6226in +0/-.0002 [41.2146mm +0/-.0051]
WITH PIN DIAMETER .....= 0.1200in [3.0480mm]
NO GO RING GAGE TO CHECK MIN. EFFECTIVE TOOTH THICKNESS
TO MEASURE BETWEEN TWO PINS ...= 1.2787in +.0002/-0 [32.4790mm +.0051/-0]
WITH PIN DIAMETER .....= 0.1080in [2.7432mm]

** FEMALE **
FLAT ROOT SIDE FIT

	INCH-MAX	INCH-MIN	MM-MAX	MM-MIN
MAJOR DIAMETER OF PART	1.5220	1.5170	38.6588	38.5318
MINOR DIAMETER OF PART	1.3800	1.3750	35.0520	34.9250
EFFECTIVE SPACE WIDTH	0.0992	0.0982	2.5197	2.4943
ACTUAL SPACE WIDTH	0.1006 REF	0.0996 REF	2.5545 REF	2.5291 REF
TRUE INVOLUTE FORM DIA MIN		1.5000		38.1000
MEASUREMENT BETWEEN TWO PINS, BASED ON ACTUAL SPACE WIDTH, IS FOR REF ONLY				
USE 0.1080in [2.7432mm] PINS	1.2823	1.2804	32.5707	32.5219

GO COMPOSITE PLUG GAGE TO CHECK MIN. EFFECTIVE TOOTH SPACE
MAJOR DIA .....= 1.5000in +.001/-0 [38.1000mm +.0254/-0]
MINOR DIA TO CLEAR TIF DIA MAX = 1.3730in [34.8742mm]
TO MEASURE OVER TWO PINS .....= 1.6198in +.0002/-0 [41.1441mm +.0051/-0]
WITH PIN DIAMETER .....= 0.1200in [3.0480mm]
NO GO COMPOSITE PLUG GAGE TO CHECK MAX. EFFECTIVE TOOTH SPACE
TO MEASURE OVER TWO PINS .....= 1.6214in +0/-.0002 [41.1834mm +0/-.0051]
WITH PIN DIAMETER .....= 0.1200in [3.0480mm]

NOTES:
NO CHANGES-REPRINTED FOR QS-9000 & ED-CAT.

Attachment B
Page 7 of 10
Reference L-377F